The Journal of Obstetrics and Gynæcology of the British Empire

VOL. XIII. JUNE, 1908. No. 6.

The Supports-in-Chief of the Female Pelvic Viscera.*

By R. H. PARAMORE, M.D. (Lond.), F.R.C.S. (Eng.).

(I.) THE CONNECTIVE TISSUE.

THE two great claimants concerned in this question are the pelvic visceral connective tissue and the pelvic diaphragm, of which the levator ani muscle forms the principal part. These, either separately or together, support the viscera from below. But the viscera are also maintained in their position by the application of a force from above, the intra-abdominal pressure; and in the erect posture their own weight, and the weight of the superimposed viscera, act in the same direction. Whilst the effect of gravity, however, is of little importance, because of the relative insignificance of its force, the intra-abdominal pressure, on the contrary, is of very great consequence, and it is mainly owing to the neglect of this important factor that misconceptions have arisen.

Recently considerable attention has been paid to the visceral connective tissue of the pelvis, and owing to its strength and toughness it has been regarded, both by anatomists and gynæcologists, as playing a principal rôle in the maintenance of the pelvic viscera in their normal position.

Thus last year (1907) no less than five papers appeared in the *Journal of Anatomy and Physiology* on the connective tissue, fasciæ and muscles of the pelvis. In the January number Professor Paterson describes "the suspensory ligament of the genito-urinary organs," which, he says, arises from the general fascia as a crescentic fold in the neighbourhood of the ischial spine" and "extends across the pelvic cavity, forming on each side the suspensory ligament of the vagina and urethra."

In the July number Dr. Ovenden states the result of re-investigations of the ligamentum transversalis colli, first described by Mackenrodt in 1895. She says:—

"There can be no doubt that in the dissection of the pelvis this

* Read on May 14th, at the meeting of the Obstetrical and Gynæcological Section, Royal Society of Medicine.

band forms an easily defined and striking object. . . . Traced to its distal attachments, this band is found to be formed from strong fibrous connective tissue, continuous with that which surrounds the pelvic blood-vessels and also that which comes through the sacro-sciatic notch. Some of the fibres appear also to be attached to the sides of the third and fourth pieces of the sacrum."

As regards the central attachment:—

"The ligament is inserted partly into the vault of the vagina and the lateral fornix, but also directly into the side of the uterus for a short distance below the point of entrance of the uterine artery. It constitutes the tissue which is generally clamped or tied along with the uterine artery in the operation for vaginal hysterectomy."

Of the two papers by Derry (October), one is on "The Muscles of the Pelvic Floor" and the other on "The Real Nature of the So-called Pelvic Fascia." In the latter it is stated:—

"The viscera are all embedded in subperitoneal connective tissue. . . . This tissue is condensed in places to form definite ensheathing layers, particularly in the neighbourhood of the vagina and lower part of uterus in the female.

". . . these layers . . . pass gradually into the general mass of subperitoneal tissue which fills the whole pelvic cavity, and are then no longer traceable; . . . it is quite distinct from that layer generally known as parietal pelvic fascia. . . .

"The suspensory ligament described by Professor Paterson as arising in the neighbourhood of the ischial spine is nothing more than the attachment in this position, *i.e.*, to the most posterior part of the 'white line' of the subperitoneal connective tissue, which here envelops the vessels passing to the viscera, including the ureter and vas deferens."

The last paper by Cameron [1] has been sufficiently quoted in a recent contribution. In reference to this connective tissue Dr. Cameron says:—

"It may now be recognized that we have here a sort of fascial mesentery, which must constitute an effective support to the pelvic viscera."

Mackenrodt, in 1895, showed that the upper part of the broad ligament can be cut through without causing any change in the position of the uterus, which only occurs when its deeper portion—the ligamentum transversalis colli—is divided (Whitridge Williams).

Dr. Ovenden says:—

"Both Emmet and Schauta have laid emphasis on the importance of the part played by this connective tissue in maintaining the normal position of the uterus."

1. *Journ. Anat. and Physiol.*, October, 1907.

On the other hand, Halban and Tandler[1] say:—

"Fritsch denied the existence of these structures, nor are we able to recognize their anatomical individuality."

It has recently been put forward by Dr. Fothergill[2] that the operation of vaginal hysterectomy reveals the nature of the real supports of the uterus, and the fact is offered that—

"Until this (the tissue known as the parametrium) is divided on each side, the organ (uterus) is, for practical purposes, as completely supported as before any incision was made."

Dr. Fothergill continues:—

"The inevitable conclusion is that the vessels and other structures, with their sheaths or fascial coverings, which lie on each side of the uterus, below the broad ligament and above the lateral fornices, are the structures which support the uterus."

This statement is perfectly true as regards this particular case, but it cannot be accepted as applying universally. It is true that when the levator ani muscle is paralysed by a general anæsthetic and its anterior margins are strongly separated by weighted retractors or powerful assistants, that then this connective tissue, with its vessels and nerves, tends to keep, or keeps, the uterus in place. But because this is so in a particular case it does not therefore follow that it is universally true. And this is what Dr. Fothergill has assumed. On the contrary, when the levator ani muscle is not paralysed, and has not been previously injured, the muscle, which closes in the abdomino-pelvic cavity inferiorly, contracts to an extent reflexly demanded by the intra-abdominal pressure and the posture assumed by the individual, and so prevents the extrusion of these, the lowest placed viscera.

If the conception put forward by Dr. Fothergill, and supported by other authorities, is really the true one—that the perivascular sheaths and connective tissue alone do support the pelvic viscera—it necessarily follows that these sheaths of connective tissue, except when the woman is lying down at rest, are subject to a continuous tension, which is sometimes greater and sometimes less. This is the result of (1) the action of gravity upon the pelvic viscera themselves; (2) the weight of the super-imposed abdominal viscera upon them; and (3) the intra-abdominal pressure.

If, however, this conception is fallacious, and if the truth is that the pelvic viscera are maintained in their positions by the activity of the levator ani muscle, it necessarily follows that the parietal connective tissue which attaches this muscle to the skeleton is subject, except when the woman is lying down at rest, to a continuous tension,

1. "Anatomie und Aetiologie der Genitalprolapse beim Weibe," 1907, p. 22.

2. Fothergill: "Supports of the Pelvic Viscera," *Proc. Roy. Soc. Med.* (Obstet. and Gynæcol. Sec.), No. 3, and *Journ. of Obst. and Gyn. of Brit. Emp.*, Jan. 1908.

which is sometimes greater and sometimes is less; for the weight supported and the pressure resisted by the levator ani muscle is of necessity transmitted to its connective tissue attachments. Hence the question arises: If the visceral connective tissue, which passes from the pelvic wall to the viscera, is unable to support these viscera, how is it possible that the connective tissue attachments of the muscle are capable of doing so?

Now what is the value of connective tissue as a supporting agent in the living individual, and how does it behave in the presence of continuous tension?

First, as regards the supporting connective tissues properly so called, which unite the bones together, complete the skeleton, and by means of which the muscles are attached to the bones and to each other.

A study of the causation of orthopædic deformities shows that when momentary excessive forces spend themselves frequently on these tissues, or when ordinary and non-excessive forces are brought to bear upon them for prolonged periods of time, without intervals of rest, the connective tissues yield. And this results independently of their original strength and durability, and is dependent only upon the time during which the force is in operation.

Of the great variety of instances of this pathological fact occuring in the body, we may call to mind the linea alba in the latter months of pregnancy and the yielding which so commonly occurs from the continuous stretching of the abdominal wall.

To pass now from that variety of connective tissue which binds the muscles together to that other variety which connects the viscera with each other and to the (posterior) abdominal wall, we may for one moment consider what happens to the mesentery of the intestine with its contained arteries, veins, lymphatic vessels, nerves and supporting connective tissue when the gut becomes extruded into an inguinal, femoral, umbilical or any other hernia. Reflection at once shows how all these structures yield. Nor can any other result be expected when, instead of a local weakness in the muscular parietes, the weakness is general; and a universal hernia of the abdominal contents, forwards and downwards, into a pouched, distended, overstretched, inefficient abdominal wall occurs. Enteroptosis is the result of a primary weakness in the entire muscular parietes (Keith). When the support, which the muscle in health gives, becomes lost, the other so-called supporting apparatus of the viscera—the so-called ligaments and the arteries with their connective tissue sheaths—has to bear the burden of the viscera, and is bound to be totally inefficient for this purpose.

Next, we come to the connective tissue attachments of the uterus and the other pelvic viscera, with their arteries, veins, lymphatics and nerves, and to the question of what occurs when the muscular

floor, which normally closes in the outlet of the pelvis, has become, for some reason or other, inefficient; in connexion with which we wish to remark that, in the normal, non-injured muscle, as obtains in the great majority of virgins and nulliparous women, the closure of the pelvic outlet is as efficient and as effectual as the closure of the hiatus between the base of the thorax and the pelvis, which the anterior abdominal wall fills in.

There is no reason to suppose that some sequence, strangely different from what happens in other parts of the body, occurs here. The invariable result is a stretching and yielding of all the connective tissue attachments of all those viscera which become prolapsed into the deepened pouch formed by the receding, the thinned, the atrophied, and the inefficient muscle. Yet we are told that " the one constant essential cause of prolapse is relaxation of the perivascular sheaths" (Dr. Fothergill) (*ibid.*).

It is perfectly true that prolapse cannot occur without the relaxation of the perivascular sheaths. But the point is, that these sheaths are prevented from becoming relaxed, not by any virtue of their own, but by the support that is given to them, as well as to the pelvic viscera, by the tonically contracted and healthy muscle which lies beneath them. When this support has become inefficient, prolapse occurs in spite of the existence and the strength of this connective tissue.

A comparison of the connective tissue attachments of the levator ani muscle with the connective tissue attachments of the uterus and other pelvic viscera, quite apart from the extent and the strength of each, discloses the fact that the great and the only essential difference between them is that a muscle, composed of striated fibres, is interposed between the two lateral halves of the one set of connective tissue; whilst, in the other, the visceral set, striated muscle fibres are entirely absent, and muscular tissue of the non-striated variety is so sparsely scattered through it that it can only be demonstrated satisfactorily and completely by microscopical examination.

In virtue, therefore, of the inherent peculiarity of striated muscle, that of marked extensibility and of subsequent recontraction of its fibres, the pelvic diaphragm, consisting of the levator ani muscle and its connective tissue attachments, the lateral pelvic fascia, is in reality a highly elastic obturator, capable of a considerable amount of movement in the cranio-caudal direction. In the healthy and sound condition, this pelvic diaphragm is in a continual state of activity, and as a result of the variations in pressure above, it is continually undergoing changes of tension. It is the consequence of the active production of these changes in tension (*i.e.*, the result of the relaxation and the recontraction of the muscle itself) that the physiological activity and anatomical strength of the muscle and of its tendons are entirely due.

It is to be remembered that when stretching occurs (*i.e.*, physiological paralysis from excessive tension), the muscle fibres yield first, and thus play the part of a safety valve to its connective tissue attachments. But this condition can seldom arise in the case of the undamaged pelvic diaphragm, because a force sufficient to cause such stretching is the outcome of a contraction of all the muscles enclosing the abdominal cavity; and there is reason to believe that the pelvic diaphragm is as capable of resisting any such pressure as the other muscles are capable of maintaining it. This theoretical consideration is substantiated by the clinical observation of the uncommon occurrence of prolapse in nulliparæ.

When, however, the pelvic diaphragm has been damaged by childbirth, the intra-abdominal pressure may very easily become too much to be borne, and the muscle will then give way. It is owing to the fact that the connective tissue (*i.e.*, parietal pelvic fascia) is in the early stages thus spared, that when the pressure is subsequently relieved (*e.g.*, by lying down, provided the stretching has not been too great or too long continued), the muscle is able to regain its tone and the prolapse may be spontaneously, and for the time being, cured. If, however, the muscle has been subjected to marked and continuous stretching, not only does it undergo an atrophic degeneration itself, but the same happens to its connective tissue attachments, which, besides stretching, also atrophy.

A reference to the living processes occurring in the body elsewhere confirms these statements. A good example, demonstrating how muscle fibres relax and stretch as a result of continuous tension, is shown in the treatment of cases of fracture of the long bones. When a weight is applied to the leg, after some little time the irritated and contracted muscles first relax and later stretch. This yielding of the muscle occurs before stretching of the ligaments of the knee-joint; but the fact that these ligaments may stretch, if the weight be too great, is generally known.

In contrast to this unity of effect of overpowering force upon muscle and its connective tissue comes the fact that as the outcome of increased use of the muscles the connective tissue attachments of the same become stronger and more clearly marked. If the use is very considerable, yet not excessive, the muscle hypertrophies and so do the connective tissue attachments. A comparison of the bones from subjects of different muscular development shows quite clearly the truth of this statement. From a muscular man the bony ridges and other places where the muscles were inserted are all well marked; from a weakly individual, however, the reverse is the case. The same results to the fasciæ and ligaments, by the medium of which the muscles are attached, as to the bones themselves.

From a consideration then of the actual relative anatomical conditions of muscle and of its connective tissue attachments found in

the body, we are forced to the conclusion, indeed a reasonable one, that these are the outcome of the physiological functioning of the structures concerned, in which the connective tissue attachments play an entirely passive rôle; and that these latter are entirely dependent upon the integrity of the muscle, with which they are connected, for their structure and strength—since hypertrophy of the muscle results in hypertrophy of its connective tissue attachments, and atrophy of the muscle in atrophy of its connective tissue attachments. It therefore follows that the connective tissue attachments of the levator ani muscle, upon which the strain of resisting and successfully opposing an increased intra-abdominal pressure is transmitted, themselves depend on the muscle for their strength and their capacity of performing this function; and that the successful resistance to increased tension of their fibres or pressure from above upon their surface, is not the outcome of any inherent peculiarity it may be supposed they possess, but is the direct consequence of the activity of the muscle of which they form essential continuations.

It is interesting to read, in the paper by Professor Peter Thompson upon "The Arrangement of the Fascia of the Pelvis,"[1] that the fascia lining the pelvic wall above the attachment of the levator ani, "is thicker, more aponeurotic and less transparent than the perineal portion, which is thinner and more membranous, allowing the underlying muscular fibres to be seen through it"; and, further, that this supra-muscular or pelvic layer really consists of two superimposed sheets, the outer one of which is continuous with the perineal portion of the pelvic fascia (lining the outer wall of the ischio-rectal fossa), and an inner sheet which stretches from the origin of the levator ani up to the brim of the pelvis to be attached to the ilio-coccygeus is continuous with this aponeurosis, which, lying on the upper part of the obturator fascia, passes upwards to be attached to the ilio-pectineal line." Further on he continues: "Of the aponeurosis with which the ilio-coccygeus is continuous, I venture to suggest that it represents the upper fibres of the ilio-coccygeus and the investing fasciæ."

The fact that this fascia, as described by Professor Peter Thompson, is thicker and more aponeurotic than the fascia covering the obturator muscle is in favour of the opinion that the muscle of which it is the tendon is functional. If the ilio-coccygeus has lost its function in man, the aponeurosis, which forms its means of attachment to the pelvic skeleton, should be atrophied and inconspicuous.

Whilst, therefore, the pelvic diaphragm is a highly elastic membrane, the visceral connective tissue apparatus, which may be regarded as another incomplete superimposed diaphragm, is, on the

1. *Journ. Anat. and Physiol.*, 1901.

other hand, little, if at all, elastic; whether considered from the point of its fibrous tissue or its non-striated muscle fibres. The only elastic element of any extent is that given by the arteries. This, however, can hardly come into play if the connective tissue strands, the perivascular sheaths, remain unstretched; whilst if the down thrust of the intra-abdominal pressure has been so great or so long continued as to cause stretching of these sheaths, it can scarcely be expected that the arteries will be able, subsequent to the relief or diminution of the intra-abdominal pressure, to raise the pelvic viscera into their former normal position; and for this principal reason, that the arteries themselves become stretched and lengthened in these cases, as a study of the descent of the kidney and of the uterus shows.

As a consquence of the non-elasticity of the visceral connective tissue diaphragm, in the meshes of which the pelvic viscera lie, it follows, when the pelvic diaphragm, which is placed immediately beneath, recedes, that the weight of the viscera and the intra-abdominal pressure will be brought to bear upon this visceral connective tissue apparatus. When this is in a healthy and sound condition, *i.e.*, has not been previously stretched, it no doubt is capable of sustaining this weight and pressure, if it be not too great, for some little time without impairment; for the connective tissues, visceral or parietal, do not immediately yield. This occurs normally during defæcation. When this act is about to take place the intra-abdominal pressure is first raised by a contraction of all the muscles enclosing the abdomino-pelvic cavity (diaphragm, abdominal wall muscles, and levator ani). At a certain point the contraction of the levator ani muscle is inhibited, probably owing to nervous impulses ascending from the rectum; then the muscle fibres lengthen, the pelvic floor descends, the angle of the recto-anal junction becomes straightened out, and the fæcal mass is extruded by the simultaneous coöperation of the contraction of the gut and the raised intra-abdominal pressure, which, as the act is accomplished, is suddenly relieved by the opening of the glottis. Finally, the levator ani muscle returns to its usual position. During the descent of the pelvic floor the connective tissue attachments of the uterus come into play and prevent a too great descent of this organ; and it is probably mainly owing to this recurring exercise, *i.e.*, the alternating conditions of relaxation and moderate tension, that their physiological activity and anatomical strength are maintained. This may explain, then, the strength of the ligaments. It also explains why the uterus is retained in position when the surgeon pulls upon the cervix in the operation of vaginal hysterectomy. The surgeon only exerts tension on these strands of connective tissue for a few minutes. The question is, What would happen if he continued to pull for days or weeks?

But if the frequently recurring down-thrust upon the unprotected visceral connective tissue is always or generally excessive, even

though it be temporary, the connective tissue becomes impaired, yields and stretches; and subsequently, when the pelvic floor returns to its usual position, this stretching of the connective tissue remains. Thus the tissue becomes less and less capable of supporting the viscera in the temporary absence of muscular contraction. Hence it ultimately comes about that the viscera are not supported at all and on straining marked descent occurs. This is the beginning of prolapse in those uncommon cases in which the muscle has never been injured by childbirth.

When, however, childbirth has occurred, which has either been difficult or tedious, and the pelvic diaphragm has been injured by the excessive stretching, either of the muscle or its connective tissue attachments, or both, and the partial atrophy which probably results from this; then, subsequently, it is plain that this diaphragm cannot give the same support to the pelvic viscera, nor the same opposition to the intra-abdominal pressure. In consequence of this inability to meet the ordinary demands of its purpose, the pelvic viscera become thrust more and more downwards and occupy a deeper and deeper place, not so much from their own weight, nor from that of the viscera above them, but in chief as a direct result of the periodic and even moderate increment in the intra-abdominal pressure. Before the descent of this prolapse not only does the inefficient muscular diaphragm recede, but also the visceral connective tissue attachments lengthen. In short, the visceral connective tissue is dependent upon the efficiency of the pelvic floor for its integrity, and it therefore plays but a secondary part in the support of the pelvic viscera. Nor is it surprising to find that the behaviour of connective tissue here is subject to the same laws and principles which determine its activity elsewhere.

Halban and Tandler, in their book "Anatomie and Aetiologie der Genitalprolapse beim Weibe," 1907, sum up the value of the visceral connective tissue in the following way (p. 26):—

"Each structure which is connected with the uterus, and which in any way is attached to the skeleton of the lateral pelvic wall, represents in a certain measure a fixation apparatus of the uterus. No separate one of these factors has, of course, a predominant importance, but the result is determined by the harmonizing coöperation of all. If we examine the different speculative fixatory structures, now under consideration, we shall, indeed, find that they are not adapted, in virtue of their physical peculiarities, to resist successfully a much increased tension or pressure. Each separate one possesses a certain elasticity and solidity, which, however, must not be estimated very highly. The elasticity of the smooth muscle fibres is, according to the measuring of Triepal, too trifling to define. Even anatomical examinations of prolapse show how extensible all these structures are, and, indeed, the same happens in pathological processes else-

where. We need only mention the expansion of the peritoneum in herniæ, the stretching of the smooth muscle fibres in dilatation of the ventricle, etc., and the yielding of the connective tissue in different conditions.

Nevertheless, the separate structures are naturally in the position to sustain a correspondingly trifling weight, and it is to be attributed, no doubt, to the summation of the capacity of resistance of all the bespoken elements, that the weight of the uterus is supported and that it is maintained in its position. We must, however, be clear on this point, that all these means of fixation of the uterus only function as fixation structures secondarily, and that they have primarily to accomplish other physiological purposes. Corresponding to this it ought not to be forgotten that they adapt themselves in their structure to the predisposed phylo- and onto-genetically determined position of the uterus, so that the means of fixation are not a cause of the uterine position, but that their arrangement is to be regarded as a consequence of that position. Besides anteversion is earlier existent ontogenetically, before a fixatory component can be assigned to the mesodermal tissue representing the means of fixation (smooth muscle and vessels) from lack of that musculature. So also we see that, for example, in uterus unicornis and other maldevelopments, deviations of the fixation structures, entirely corresponding, are to be observed.

"By means of the structures named the uterus is fastened by a system of strings to the pelvic wall and is maintained in suspension, just as the weight of a spider is supported as it rests on its system of threads, which are fastened to the neighbouring walls. This spider's web is able to bear the proper weight of the spider, but it is not capable of supporting a greater and unusual burden. But in relation to the fixation of the uterus its proper weight has not alone to be considered, but before all other factors the result of the abdominal has to be reckoned with. The normal, not increased, abdominal pressure plays, therefore, no part, though increase of the same does. In the presence of this, the normal suspension means of the uterus is not sufficient."

(II.) The Intra-abdominal Pressure.

We must now turn our attention to this intra-abdominal or, more accurately, the intra-abdomino-pelvic pressure. This pressure depends on three factors: (1) the capacity of the abdomino-pelvic cavity; (2) the volume of the contained viscera and other contents; and (3) the condition of contraction of the muscular walls which surround and enclose it.

All these factors are variable. The capacity of the abdominal cavity is greatest when the spine is extended. On flexion of the spine the thorax approaches the pubes and the capacity is diminished. Permanent diminution is seen in cases of deformity of the lower

dorsal and lumbar vertebræ, kyphosis and scoliosis; in these cases a glance serves to show that the whole base of the thorax is lower than it should be. It is also seen in emphysema of the lungs as a result of the lowered position of the diaphragm.

Likewise, the abdomino-pelvic contents are subject to fluctuations in volume; this increase may be temporary and frequently recurring, or it may be more or less permanent. Temporary increase is due to the ingestion of food, the production of flatus, the secretion of urine and its retention in the urinary bladder. Permanent increase is caused by an excessive deposit of fat in the omentum, mesentery and retroperitoneal tissue (lipoma), the presence of ascites, the growth of a tumour or of the pregnant uterus.

The muscles enclosing the abdomino-pelvic cavity are least contracted when the individual lies down at rest; most contracted when a violent movement is made.

Concerning this pressure I have the following data to offer, which I quote from an article on "Enteroptosis" by Professor Keith[1]:—

"In the erect posture there is a positive pressure of 20 to 28 mm. in the rectum, and in the stomach 6 mm. to 12 mm. Hg. The increase of pressure in the rectum over and above that in the stomach is undoubtedly due, as Schwerdt points out, to the weight of the superincumbent viscera. The pressure exerted on the abdominal contents by the abdominal muscles maintaining one viscus against another may therefore be that estimated at 6 mm. to 12 mm. Hg.; but when the muscles of the abdomen are thrown into action it may temporarily be higher than the arterial blood-pressure. On stooping down and then lifting heavy weight, the pressure within the stomach rises to over 70 mm., that within the rectum to 120 mm. Hg.; in coughing, straining and bending temporary elevations of 50 mm. or 90 mm. Hg. are observed. In strong muscular men the intra-abdominal pressure may rise much higher, possibly to 200 mm. Hg."

(III.) The Levator Ani Muscle.

It is clear that the intra-abdominal pressure will act by tending to thrust the pelvic viscera still further downwards, upon the pelvic floor, and in the presence of an increased pressure reasons have been advanced to show that the visceral connective tissue is quite unable and inadequate to maintain the viscera in their normal position for more than short and infrequent periods of time; and even then, if the pressure is always excessive, yielding occurs.

Since the intra-abdominal pressure is very considerably increased many times in each day, as for instance in coughing, sneezing, laughing and during defæcation, especially when difficult, the question arises, How is it that in the presence of this frequently

1. "System of Medicine," by Allbutt and Rolleston, 1907, iii, p. 860.

recurring increased down-thrust, the pelvic viscera are maintained in position?

It has already been stated in an earlier part of this paper that the answer to this question is to be found in the existence of the levator ani muscle and its attachments.

We must now inquire somewhat briefly into the truth of this statement. In man the pelvic diaphragm consists of the pubo- and ilio-coccygei, which together form the levator ani muscle, and the coccygei. The disposition of these muscles is as follows: The superior fibres of the pubo-coccygeus, comprising the pubo-coccygeus proper, arise from the posterior surface of "the body of the pubis along an oblique line which extends from the lowest limit of the symphysis, upwards and outwards towards the obturator canal, and also from the obturator fascia for a limited extent" (Thompson). They form a "flat band of muscle about 1 in. wide, thick at its mesial border, thin where it overlaps the ilio-coccygeus" (Thompson), which passes directly backwards and, uniting with its fellow of the other side, is inserted by means of a forked tendinous plate into the last sacral vertebra.

The inferior fibres of the pubo-coccygeus, having lost their connexion with the coccyx and the ano-coccygeal raphé, unite with the corresponding fibres of the other side behind the perineal flexure of the rectum and below the tendinous aponeurosis which forms the insertion of the ilio-coccygeus muscle. Since these fibres embrace the rectum this division of the muscle has been called the "pubo-rectalis." It arises "from the back of the lowest part of the symphysis pubis under cover of the pubo-coccygeus, from the upper layer of the triangular ligament and from the pubes" (Thompson). When it contracts it draws the perineal flexure of the rectum forwards towards the symphysis, and thus, whilst it increases the natural bend of the gut, it also tends to obliterate its lumen. It has for this reason been called the "sphincter of the rectum" by Holl, who also refers to it as the best developed muscle in the pelvic diaphragm. At the same time it constricts the vagina, and this probably accounts for its better development in the female. Besides this relation to the rectum some of the most anterior and median fibres cross the middle line in front of the rectum and intersect with similar fibres of the opposite side, also with the deeper portion of the musculus transversus perinei profundus in the perineal body (Luschka).

Behind the pubo-coccygeus and on a somewhat higher plane is the ilio-coccygeus muscle. It appears that this may arise in two distinct ways: (1) by means of its aponeurosis, the parietal pelvic fascia, from the ilio-pectineal line (Thompson); (2) by means of a fibrous arch slung from the os pubis to the ischial spine. This "white line" is in some cases found separated by some little distance from the pelvic wall, and when this is so a pouch, filled with fat,

exists between the two. This " hiatus of Schwalbe " and this double origin of the ilio-coccygeus are described by Professor Elliot Smith in the *Journal of Anatomy and Physiology* for January, 1908, in a paper entitled " Studies in the Anatomy of the Pelvis."

I have on several occasions, when palpating the muscle, felt a tight fibrous-feeling band stretching from the pubis to the ischial spine. This I have supposed to be the tendinous arch of origin of the ilio-coccygeus; in some of these cases it has been found standing an appreciable distance from the pelvic wall. It is interesting to find that pressure on this band has caused the patient to complain of pain similar to what has been spontaneously felt at other times.

The muscular fibres pass downwards, backwards and inwards with varying degrees of obliquity, the most anterior ones passing more backwards than inwards, the most posterior being directed more inwards, but still backwards. They are inserted by means of an aponeurosis into the last two pieces of the coccyx and its tip, and into a median raphé from the coccyx to the posterior margin of the anus.

Behind the ilio-coccygeus is the ischio-coccygeus, or the coccygeus of human anatomy. It arises from the spine of the ischium and is inserted into the lateral margin of the lower sacral and upper coccygeal vertebræ. Although this muscle can have very little power over movement of the coccyx, it is of interest to find that it is composed of muscular as well as fibrous tissue, and must have, therefore, some other remaining, yet slight, function, *e.g.*, offering resistance to pressure from above.

" These individual muscle sections of the pelvic diaphragm do not by any means form a uniform sheet in one plane, but overlap one another posteriorly where they join the corresponding muscle of the other side. By this means the part of the diaphragm posterior to the rectum is clearly strengthened." (Halban and Tandler).

In the recent contribution to this subject,[1] already cited, the view has been put forward that the levator ani is a degenerated muscle, and that it is incapable of supporting the pelvic viscera. This plea was supported by two facts.

The first fact is that in the course of evolution the human being has lost the tail. From this the inference was drawn that the representatives of the tail-moving muscles in the lower animals has in man become so degenerate as to be useless.

It is true that with the loss of the tail the muscles have altered as regards their origins and insertions, and have either almost completely, as in the case of the coccygeus, or partially, as in that of the upper part of the ilio-coccygeus, represented by the parietal pelvic fascia, degenerated; and it is possible, if other evolutionary

1. *Proc. Roy. Soc. Med.*, Obstet. and Gyn. Sec., i, 3.

changes had not, concurrently with these alterations, been in process of development, that the levator ani had disappeared altogether. But with the loss of the tail, the individual has assumed the erect posture, in which it is certain greater pressure is brought to bear upon the pelvic floor than in the horizontal position; and in order to meet this demand the remnants of the long tail-wagging muscles have undergone special adaptations, have become spread out to form a wide muscular sheet, upon the integrity of which the maintenance of the pelvic viscera is entirely due.

A study of the conditions obtaining in the lower animals supports this view. Thus Professor P. Thompson writes[1]:—

"In all mammals the closure of the 'clefts' or 'faults' in the pelvic floor, through which the rectal and genito-urinary canals are transmitted, is brought about by the action of muscular fibres; and the compact mass forming the floor of the pelvis is therefore, even in its simplest form, partly muscular; the rest is made up of connective-tissue and integument. The muscular fibres, which form a distinct layer in the pelvic floor, surround the canals which traverse the 'clefts,' and they control or guard these canals at their outlet; in other words, the layer is largely sphincteric in action. It is obvious that a pelvic floor so constituted is not specially adapted for support.

"But a great difference in the architecture of the pelvic floor is apparent in those mammals in which the long axis of the body is either absolutely or approximately vertical. In them the floor is further modified for the support of the abdominal viscera, and, in addition to the layer of muscle controlling the clefts, another is developed in the form of a well-marked diaphragm, which constitutes a muscular sheet attached on all sides to the walls of the pelvic cavity. In the human subject this sheet includes the levatores ani and coccygeal muscles." (Introduction.)

The evolution of this pelvic diaphragm is interesting. It appears that "both the ilio-coccygeus and pubo-coccygeus are the result of a lateral extension on to the side wall of the pelvis from a single powerful flexor of the tail, situated on the ventral aspect of the sacral and caudal vertebræ." In some animals (monotremes and some marsupials) the three muscles are not distinct from each other. On the other hand, in others (mare and cow) they are not represented at all; and, therefore, in these no morphological equivalent of the levator ani exists. Thompson.) As regards the cause of this absence Professor Thompson says: ". . . it is by no means evident why suppression of certain of the caudal muscles should have resulted."

May not the explanation be found in the fact that in the animals referred to (mare, cow) the body is always, or nearly always,

1. "Myology of the Pelvic Floor," 1899.

horizontal? And since the pelvic outlet, which is very obliquely placed, looking more upwards than backwards, is situated at a very high level in relation to the abdominal cavity—almost at its summit—it cannot have the same pressure brought to bear on it as it would have if the body were carried vertically; so that the weight of the viscera with their contents is sufficient, with the sphincteric muscles which are attached to the pelvis, to prevent any extrusion.

The second objection to the levator ani as a functioning muscle is based on Professor Thompson's account of it in his book.[1] This author, indeed, regards the ilio-coccygeus as a degenerated muscle; he says (p. 75):—

"Primarily, the muscle passes from the ilium to the caudal vertebræ—a condition retained in most mammals. But the reduction of the caudal vertebræ has been accompanied by a corresponding reduction in the muscles which act on them; so that the ilio-coccygeus in man is just as much a degenerated muscle as the coccygeus or abductor caudæ."

Further:—

"The action of the ilio-coccygeus must necessarily be feeble, and is practically limited to drawing forwards the coccyx and the fibrous raphé between it and the anus. When ankylosis occurs of the various pieces of the coccyx and of the coccyx with the sacrum, the action of the muscle is still further restricted."

But as regards the pubo-coccygeus the author takes a different view:—

"The pubo-coccygei are perhaps the most important muscles in the pelvic floor, since upon them depends the restoration of the floor to its normal position after it has been depressed by defæcation and parturition, etc."

Again:—

"The arrangement of the pubo-coccygei is admirably adapted for the support of the superimposed structures."

Concerning these statements I have the following remarks to make:—

(1) If the ilio-coccygeus is a degenerated and unnecessary muscle, why is it present in man, whilst it is absent in some other animals (mare, cow)? It is stated that "whereas in tailed apes the levator ani attains a thickness of more than 5 mm., in anthropoids it is thin and almost transparent" (Thompson). From which it may be thought, surely with some truth, that if loss of function and its attendant structural atrophy had commenced in these anthropoids, this latter would have reached a further stage in man.

(2) That the function of the muscle does not alone consist in raising the coccyx and the ano-coccygeal raphé, but also in present-

1. "Myology of the Pelvic Floor," 1899.

ing, by its contraction, a firm resistance to an increased intra-abdominal pressure; and that, therefore, even in the presence of ankylosis of the coccyx itself, or of this to the sacrum, the function of the muscle, and, therefore, its activity, are not lost. That this is so is shown by the fact that muscular fibres are present, and can be easily seen, in the coccygeus, a muscle which certainly can effect no movement of the coccyx.

(3) That to function successfully as an opponent to the raised intra-abdominal pressure, the ilio-coccygeus has not to perform as much work to resist the increase in the pressure as the muscles of the abdominal wall have to perform in order to bring about the increase in the pressure.

For the sake of argument the diaphragm may be omitted, since, indeed, its position is maintained by the closure of the glottis, a trifling muscular act. And since the function of the pubo-coccygeus is to close the genital hiatus in the pelvic floor, its greater thickness and development is thus sufficiently accounted for, although, no doubt, from its median position, it plays an important part in the support of the viscera and the opposing of the intra-abdominal pressure. But is must be remembered that not all its fibres gain attachment to the vertebral column or to the fibrous raphé extending forward from this, but that a considerable portion, quite half the muscle or more, forms a loop around the rectum posteriorly, and thus can have no action in opposing increase of pressure from above. When the intra-abdominal pressure is raised, two definite muscular actions take place: (1) Both parts of the pubo-coccygeus—*i.e.*, the pubo-coccygeus proper and the pubo-rectalis—contract, and lessen or obliterate the genital hiatus; (2) the pubo-coccygeus proper and ilio-coccygeus contract, and present a resistance to the descending viscera. This can be verified by palpation of the muscle; on getting the patient to cough the muscles will be felt to contract.

When the size of the pelvic outlet is compared with the area filled in by the anterior abdominal wall, reflection will show that the levator ani will have to perform much less work to oppose a force caused by the contraction of the muscles of the anterior abdominal wall than these muscles will have to perform to produce that force. We have here, indeed, the mechanism of the force pump. The small outlet is the pelvis, the piston is the levator ani muscle, the work to be done is the paralysis of the pressure produced by the extensive anterior abdominal wall; only in the body the levator ani remains more or less stationary in position, and its activity—that is its resistance—is increased or diminished according to the pressure that is brought to bear on it by the contractions of the other muscles.

It therefore follows that the muscles of the anterior abdominal wall (recti excluded) must of necessity be considerably thicker, *i.e.*, stronger, than the ilio-coccygeus; so the fact of the relative thinness

and apparent weakness of the ilio-coccygeus is not a reason for rejecting the efficiency of the muscle, but it is what physical laws would lead us to expect.

(4) That in the examination of anatomical specimens of this muscle it is necessary to know something about the general muscular development and the age of the cadavers from which they were obtained, and whether childbirth had occurred, for a degenerate condition of both parts of the levator ani is not uncommon, as the frequency of cases of prolapse shows.

For these reasons I am not inclined to regard the ilio-coccygeus muscle as being such a degenerate structure as the quotations referred to would lead one to suppose.

Whilst it is difficult to allot the share that each of the principal parts of the levator ani muscle takes in the support of the viscera and opposition of the intra-abdominal pressure, we may in conclusion ask: What is the evidence for believing that this muscle as a whole performs this function?

(1) The muscle really exists, and preparations of it are to be seen.

(2) Ample evidence of the existence of the muscle and of its functioning is to be obtained in the living.

Dr. Fothergill[1] says:

"The narrow lower opening of the funnel-shaped pelvic diaphragm is not to be felt so often as descriptions would suggest; and in parous women it is often difficult or impossible to recognize the margin of the levator ani."

I cannot agree with this stafement. During the last six months I have paid particular attention to this question, and have palpated for the levator ani muscle in nearly every case I have examined, with the result that in the majority I have been able to feel it distinctly. The patients in whom it is difficult to feel are those who are very fat, the thickness of the fat in the ischio-rectal fossa masking any sensation that the muscle fibres might impart to the fingers. Whilst it is true that palpation is not delicate enough to reveal the presence of the thin inner and lower part of the pubo-rectalis, which passes to the perineal body, the mass of the pubo-coccygeus itself, which guards the cleft in the anterior part of the basin-like floor, can be distinctly felt. Finally, the ilio-coccygeus can be as easily palpated as the pubo-coccygeus, and its line of origin from the pubes to the spine of the ischium, frequently an easily palpable point, can often be clearly made out.

The method adopted is the simplest possible. Two fingers are inserted into the vagina and the thumb is placed over the skin of the ischio-rectal fossa; on bringing the fingers and thumb together the muscle is to be felt between them. The pubo-coccygeus is the more

1. *Journ. of Obstet. and Gyn. of Brit. Emp.*, January 1908, p. 18.

medianly and the more inferiorly placed (pubo-rectalis); by passing the fingers higher in the vagina and more laterally, and moving the thumb externally in the same direction, the ilio-coccygeus can be felt.

The levator ani is most easily palpable when it is best develpoed, that is in nulliparous women who are not stout. The muscle is also to be felt in cases of prolapse. The presence of the muscle can be more more easily made evident by getting it to contract. If the patient is asked to cough whilst palpation is being conducted the levator ani muscle will be felt to contract at the same time as the other muscles of the abdominal cavity.

(3) Finally, to quote again from Halban and Tandler, who speak as follows:—

"The proof that this musculature has, as a matter of fact, to perform this office, and that it is capable of performing it under normal conditions, is confirmed by the study of the pathogenesis of genital prolapse, for when the muscle under consideration becomes defective or insufficient from any cause, a displacement of the pelvic viscera invariably arises. The best example of this is furnished by cases of paralysis of the pelvic floor musculature, and this is to be observed in the most beautiful way in congenital prolapse in cases of spina bifida.

"If the fourth sacral nerve is included in the sac of the meningocele, a congenital paralysis of the pelvic floor musculature results, and corresponding to this a pouch-like dilatation of the pelvic floor and a descent of all the pelvic contents, as well in the male as in the female subject, is produced. This is principally manifested by the obliteration of the crena ani, the descent of the anal orifice, and the convexity of the whole perineum as can be seen on inspection of the parts. On section it is proved that, as a matter of fact, the collective pelvic viscera are much more deeply placed than normal, and, moreover, in the female fœtus it accounts for the formation of a genital prolapse in consequence of the insufficiency of the muscular closing apparatus."

A case of this kind was shown by Dr. Russell Andrews before the Obstetrical Society in April, 1902,[1] but no adequate explanation was given for its occurrence. That the lesion is a nervous one is shown by the fact that paralysis of the legs and talipes are often present.

Conclusion.

It is therefore evident that the pelvis viscera are maintained in their position by two sets of forces. The one acts from above and pins, so to speak, the viscera in their places. This is the intra-abdominal pressure. The other acts from below, supports the

1. *Trans.*, xliv, p. 137.

viscera, and prevents them from being displaced by any excessive force from above. These two forces, therefore, vary directly with each other; increase of the one reflexly produces increase of the other. This mechanism is under a nervous control, which determines any desired end (coughing, defæcation, etc.).

As regards the force from below this is supplied by the levator ani muscle. This is the essential element in the maintenance of a normal visceral position. When the pelvic floor is inhibited during defæcation, the visceral connective-tissue is capable of supporting the viscera temporarily, but it is not capable of more than this. When the muscle has become insufficient this connective-tissue is unable to maintain the viscera in posiiton.

On the Pathology and the Operative Treatment of Displacements of the Pelvic Viscera.*

By W. E. Fothergill, M.A., B.Sc., M.D., Manchester.

In a recent paper,† the writer reviewed some anatomical work which seems to promise a welcome simplification of teaching as to the supports of the pelvic viscera. The present communication contains an attempt to indicate some practical applications of this anatomical work. Let it be said at once that etiology is not discussed below, the actual lesions and their surgical treatment being considered without any reference to their various causes.

The structure primarily involved in these lesions is the denser portion of the connective tissue which intervenes between the pelvic diaphragm and the pelvic viscera.

The upper surface of the pelvic diaphragm is lined by fascia, the aponeurotic covering of the muscles which form it. The viscera have their own coverings of connective tissue. Part of the intervening connective tissue is loose and part is dense. The denser portion is that which forms the sheaths of the blood-vessels, the lymphatics, the nerves and the ureters. These structures, together with their sheaths, form lateral masses of tissue which extend between the sides of the pelvis and the lateral aspects of the uterus, the vagina and the bladder; and which hold these organs in the position they usually occupy.

The upper margin of each lateral supporting mass is in a manner defined by the internal iliac artery and its direct continuation, the obliterated hypogastric artery. The mass is fixed behind by the internal iliac vessels and is firmly attached to the innominate bone. The posterior branch of the artery anchors the mass near the sacro-sciatic notch. The obturator artery anchors it near the obturator foramen. The obliterated hypogastric fixes it to the abdominal wall. The uterine, vaginal and visceral vessels run downwards and forwards to the viscera. The connective tissue ensheathing these arteries and the accompanying veins and lymphatics is the matter under consideration. The rectum has a separate vascular supply and a separate attachment to the back of the pelvis. It is thus independent of the other viscera and lies loosely in a channel between the lateral masses of tissue which fix them within the pelvic diaphragm.

* Based on a paper read at a meeting of the Edinburgh Obstetrical Society on March 11th, 1908.

† *Journal of Obstet. and Gyn. of the British Empire*, January 1908.

Pathological Considerations.

Classical Prolapse.

Elongation of the perivascular connective-tissue described above must be regarded as the one essential and constant lesion in the pathology of prolapse of the pelvic viscera, namely, descent of the uterus and its appendages with the bladder, urethra and vagina.

No one who is in the habit of opening the abdomen and seeing the so-called ligaments of the uterus lying loose and flaccid will maintain that prolapse is in any way dependent upon elongation of these structures. Again, there is ample clinical evidence to show that injury of the pelvic diaphragm is quite a secondary and accidental factor. For we constantly see women in whom the perineum has been badly lacerated, but who present no symptoms of prolapse. Indeed, in cases of complete tearing into the rectum, prolapse is the rare exception and not the rule.

Prolapse is not uncommon in virgins and nulliparæ; and in them the descending viscera quickly dilate the orifice of the pelvic diaphragm and overcome the action of the sphincter layer of muscles.

If the pelvic organs are loose, they will naturally descend more easily in a patient whose perineum has been torn than in one whose pelvic floor is sound; but tearing of the perineum and levator ani is a separable accident favourable to prolapse—not a prime cause of it.

The normal channel from the pelvis to the exterior is narrow and curved, the normal perineum forming a corner which must be turned by an escaping mass, fœtal or hernial. If the channel has been widened and straightened by tearing or stretching of the perineum, prolapsing viscera will descend more easily than they would otherwise do, but that is all.

On the other hand, if the normal attachments are tense and firm, no injury to the pelvic floor will make the organs descend.

A prolapsed uterus, in fact, is like a loose kidney, and has an elongated attachment. In other words, elongation of the pelvic perivascular connective-tissue is the one constant and essential lesion characterizing the pathology of the condition.

Cystocele and Vaginal Prolapse.

In classical prolapse or sacro-pubic hernia, the attachments of the uterus, the vagina and the bladder are all relaxed. But it is possible for part of the perivascular connective-tissue to be affected without the whole mass of supporting tissue becoming lengthened. Thus the bladder and anterior vaginal wall may descend in cystocele, or both vaginal walls may be everted, the uterus remaining anteverted and at its ordinary level in the pelvis.* In such cases the lower

*Rectocele, it should be mentioned, is a special condition and an apparent exception to the rule that the rectum is independent of the other pelvic viscera. But in rectocele there is pathological adhesion of the anterior rectal wall to the posterior vaginal wall, the result of inflammatory infiltration of the recto-vaginal septum during the healing of infected perineal tears.

portion of the supporting mass is alone affected, the upper portion preserving its tension.

Retroversion.

The uterus itself is practically supported by the parametric tissue, which lies below the free broad ligament and above the vaginal fornices. This is the tissue which has been called the transverse ligament of the uterus. But it is not a definite ligament, as it consists of all the structures between the base of the mesosalpinx and the vaginal roof. Neither is it transverse, for the structures composing it run forwards and downwards to the cervix following the course of the anterior division af the internal iliac artery.

It is possible for the parametric tissues to be elongated without relaxation of that which supports the vagina and the bladder. This allows the cervix to move or drop further forward in the pelvis than is normal, without permitting any cystocele or vaginal prolapse. When this condition pertains, some factor, such as over-distension of the bladder, can easily turn the fundus backward into the pouch of Douglas, and a position of retroversion thus established may either remain occasional and temporary or may become permanent.

Summary.

Thus relaxation of different parts of the perivascular connective-tissue gives different results:—

Relaxation of upper part alone=retroversion.

Relaxation of both upper and lower parts=classical prolapse.

Relaxation of lower part alone=cystocele and vaginal prolapse.

The Operative Treatment of Displacements.

A. *Classical Prolapsus Uteri (Sacro-pubic Hernia).*

If we accept the view above expressed as to the essential nature of prolapse, it follows that the truly surgical method of treatment would be to shorten the mass of tissue which attaches the pelvic viscera to the sides of the pelvic diaphragm. But there are obvious technical difficulties in handling a mass of tissue which contains embedded in it important arteries, veins and lymphatics, as well as the ureters, and which is attached to the whole of the surface of the vagina, a large portion of the surface of the bladder and to the lateral and anterior aspects of the cervix uteri.

The most that surgery can accomplish in this direction is to alter the attachment of the more easily accessible portions of this mass of tissue to the cervix and the upper part of the vagina in such a way as to "take up the slack" in some degree.

Several operations have been designed with this intention. One of these is Alexandroff's operation (*Zeit. f. Gyn.*, 1903, No. 25), in which a curved incision is made across the anterior vaginal fornix so

as to allow free separation of the bladder from the uterus and the parametric tissues. The bladder being pushed well up, temporary ligatures are passed into these tissues about an inch and a half from the cervix on either side. These ligatures, when crossed and pulled upon, bring together the elongated parametric tissues in front of the cervix, which is thus lifted upwards and backwards in the pelvis. Sutures are then inserted so as to unite the tissues to one another and to the anterior aspect of the cervix. The temporary ligatures are then removed and the vaginal incision is closed.

Hastings Tweedy (*Journal Obstet. and Gynæcol. of the British Empire*, May, 1905) has described a similar operation; but he recommends, as preliminary stages, opening the peritoneal cavity both in front of and behind the uterus, and detaching the vaginal wall from the parametric tissues on either side.

In the North of England several operators have for many years done anterior colporraphy in a way which enables them to bring together in the middle line in front of the cervix a good deal of the parametric tissue and a good deal of the paravaginal tissue of both sides, without endangering the ureters or the blood supply of the parts.

Donald, of Manchester, has described his method of securing this object in a recent number of this JOURNAL.

The operation, as done by the writer, is begun by cutting across the vaginal wall between the cervix and the bladder. This transverse cut extends into the lateral fornices for 1½ or 2 inches on either side of the middle line. The bladder is then separated freely from the cervix and from the vaginal walls down to 1½ or 1 inch from the urethral aperture. The vaginal wall is then freely cut away. The portion removed is roughly triangular in shape, its base being at the vaginal roof and its apex 1½ inches or so from the urethral aperture. The bladder, and with it the ureters, being pushed well up and out of harm's way, the uterus is also pushed up into the pelvis and sutures are inserted so as to unite the parametric and paravaginal tissues to one another and to the anterior aspect of the cervix. These sutures may be buried, or they may be made to include the margins of the vaginal wall so that when tied they bring together the portion of the original incision which is nearest to the cervix. In either case the result is to unite in front of the cervix certain portions of tissue which previously were widely separated and lay at the sides of the cervix and vagina. This effectively shortens the supports of the organs in question.

As the lower part of the incision is closed the sutures are made to penetrate the tissues underlying the vaginal wall, and thus the paravaginal tissue is drawn from the sides to the front of the vagina. This is an old and well-tried method of performing anterior colporraphy, and its value is undoubted. The anatomical considera-

tions which underlie this paper afford a complete rationale of the success of this operation, by showing that the tissues which it moves from the sides to the front of the vagina and cervix are those of the most importance as normal supports of the viscera. It is thus a scientific operation which has been designed and carried out empirically, and is probably of greater practical utility than the newer operations proposed by Alexandroff and Hastings Tweedy for reducing to their normal length the connective-tissue supports of the uterus and vagina.

It has been granted that relaxation or tearing of the pelvic diaphragm and of the perineum favours the prolapse of loose pelvic viscera by widening and straightening the canal through which they descend. Now it is certain that the perivascular connective-tissue, when once elongated, can never be perfectly repaired; and that pelvic organs which have once been loosened will always be loose. In every case, therefore, in which the operative treatment of prolapse is attempted, steps should be taken to improve the perineum and to narrow the vaginal canal in order to check recurrence of the condition. In short, the operation of anterior colporraphy should always be reinforced by posterior colporraphy and perineorraphy. One of the most satisfactory ways of doing this is to work from above downwards, according to the method of Donald, stripping a gradually widening tongue of the posterior vaginal wall from the rectum and the perineal body. The upper portion of the incision can be sutured before the lower portion is completed, and buried sutures may be used with advantage in forming the new perineal body. But the details of these operations may well be decided by each operator for each individual case.

The writer prefers, in some cases of prolapse, to complete the operative treatment by ventrofixation. This is doubtless an unsurgical measure, but in practice it has proved to be a useful and harmless one.

It is necessary, in many cases, to leave the vagina large enough to permit coitus and parturition, and something further than the plastic operations on the vagina is thus frequently necessary. The writer is usually guided, in deciding whether ventrofixation is necessary or not, by the position assumed by the uterus after anterior and posterior colporraphy and perineorraphy have been done. If the uterus is then found to be anteverted, there is a good chance of permanent cure without further interference, but if the uterus is still in a position of retroversion, the prolapse will tend to recur.

Under these circumstances the operation of ventrofixation is the only one suitable; for the round ligaments cannot be trusted to give any permanent support to the loosened pelvic organs. All the operations performed by shortening these vestigeal structures are uncertain in the treatment of prolapse. What is known as ventro-

suspension is also useless for this purpose. What is required is permanent union between the anterior surface of the uterus and the posterior sheath of the recti.

The best time to do this operation is at the same sitting with and after the vaginal operations. This saves the patient three or four weeks in bed and a second administration of an anæsthetic with its unpleasant after effects. In certain cases it is doubtless necessary to defer the ventrofixation for a time.

The writer's usual course is to have the patient placed in the Trendelenburg posture immediately on the completion of the perineorraphy. In this posture ventrofixation can generally be done without putting any swab or sponge into the abdominal cavity, and practically without seeing or touching the intestines. The abdomen is carefully opened through the linea alba by an incision extending from the symphysis half-way up to the umbilicus. The appendages are then rapidly examined and the uterus is raised towards the incision by two fingers placed behind the fundus. With a vulsellum the anterior surface of the uterus is gripped below the level of the tubes and is gently drawn into contact with the abdominal wall in the lower part of the incision. At least four sutures are then passed, fine silk or hardened catgut being used. One is transverse and below the grip of the vulsellum, another is transverse but above the grip. The other two are lateral, one on each side of the grip. The curved needle passes through the anterior sheath of the rectus, through the muscle and through its posterior sheath, but not through the peritoneum. After taking a good bite of the uterine wall, the needle returns through the same tissues, and the suture is tied on the anterior surface of the anterior sheath of the rectus. A square inch of the uterine wall, with the portion wounded by the teeth of the vulsellum in its centre, is thus fastened to the posterior sheath of the rectus muscles. If the uterus is large and heavy, two lateral sutures are used on either side so as to enclose a larger area. Extra transverse sutures may also be used. The peritoneum is excluded, by this method of stitching, from the area of union between the uterus and the abdominal wall. The operation is completed by uniting the peritoneum above and, if necessary, below the area of attachment. The fascia in front of the recti is then firmly united with interrupted sutures, and the skin edges are drawn into contact by a single subcutaneous suture of catgut.

Innumerable operations have been devised for the treatment of bad cases of prolapse in women who have passed the menopause. Bearing in mind the anatomical considerations which form the basis of this paper, it is clear that the main object should be to unite in the middle line of the body the parametric and para-vaginal tissues. The removal of the uterus together with the upper half of the vagina certainly exposes a broad surface of tissue on either side which can

be united in the middle line behind the bladder with very satisfactory results. But unless the uterus is in such an unhealthy state that it is better away, it must but rarely be advisable to submit a patient to a hysterectomy in order to cure a prolapse.

B. *Cystocele and Vaginal Prolapse.*

It has been mentioned that elongation of the lower portion alone of the perivascular connective-tissue causes cystocele and vaginal prolapse.

The operative treatment of these conditions calls for no comment. It is conducted with perfect results by the ordinary operations of anterior colporraphy, posterior colporraphy and perineorraphy. It is perhaps hardly necessary to insist that cases in which these conditions occur must be carefully distinguished from cases of prolapse in an early stage. The position of the uterus probably affords the best criterion. If the uterus remains anteverted, it is unlikely that the parametric tissues are elongated, and the case cannot be regarded as one of classical prolapse. But any case of descent of the anterior or posterior vaginal walls in which the uterus is retroverted should be regarded as an example of true prolapse of the pelvic viscera, and should be treated accordingly.

C. *Retroflexion.*

It was stated above that in certain cases the attachments of the uterus itself, namely, the parametric tissues, are relaxed, while the supports of the bladder, the urethra and the vagina remain normal; that, in these cases, the bladder and vagina do not descend; but the uterus tends to assume a position of retroversion, with or without the change in form known as retroflexion.

It is needless to say that cases of this kind must be carefully distinguished from cases of early prolapse. From the practical point of view, only those cases should be called " retroversions " in which the position of the bladder and the vaginal walls is so perfect that there is no excuse at all for undertaking operative treatment by the vaginal route. In other words, if a case in which the uterus is retroverted can suitably be treated by a vaginal operation, it is really a case of early prolapse, and not a pure retroversion.

The treatment of retroversion and retroflexion is the subject of an old debate which is still unfinished. The question may be put as follows:—It may be taken as granted, first, that many cases of retroversion present no symptoms and require no treatment; and, second, that in many cases the retroversion is temporary, as, for instance, in early pregnancy, and in the period following parturition, during which the involution of the pelvic structures remains incomplete.

There remain the cases of chronic or permanent retroversion accompanied by symptoms. There is a mass of opinion to the effect

that in these cases the retroversion should not be treated directly, but that local and general measures should be applied with the view of relieving the conditions, congestive or inflammatory, which complicate each case. The object of those who favour this opinion is, of course, to turn each case of retroversion with symptoms into a case of retroversion without symptoms. This can often be done. But there remains a widely accepted view to the effect that the patient can often be cured most quickly, safely and pleasantly by treating the retroversion itself as well as the conditions with which it is associated.

The two masses of tissue which carry the main blood-vessels of the uterus are certainly twisted through an angle approaching 180 degrees in many cases of retroversion. This torsion of the two pedicles of the uterus, so to speak, is a definite mechanical cause of passive venous congestion of the organ which cannot be ignored.

Those who prefer to treat directly retroversion accompanied by symptoms argue as follows:—Many painful and troublesome uterine conditions are caused by or aggravated by passive venous congestion. Retroversion often causes or increases passive venous congestion. Therefore it is worth while to treat retroversion, when accompanied by symptoms, with the object of removing or at least reducing passive venous congestion.

The cases of retroversion, with or without retroflexion, in which operative treatment is available may be roughly divided into two classes.

In the first class are those cases in which the uterus can be restored to a position of anteversion and in which this position can be permanently maintained, without discomfort to the patient, by means of a pessary.

In the second class are those cases in which the uterus, on account of adhesions, cannot be placed in a position of anteversion; and those in which, on account of tenderness, prolapsed ovary or some other reason, the uterus cannot be kept in anteversion by a pessary.

In cases of the first class operative treatment is of the nature of a luxury, for health and comfort can be secured without it as easily as with its aid. As a mere alternative to pessary treatment, therefore, operation must be selected by the patient, who must take the responsibility.

In cases of the second class operative treatment is rather of the nature of a comfort. It may not be a real necessity, but it may be the only means of enabling the patient to enjoy her life or to do her work. In these cases operation may be strongly recommended by the operator.

As an alternative for pessary treatment the writer considers that Alexander's operation is allowable. While the round ligaments are not sufficiently reliable structures for use in helping to support a loose uterus, bladder, vagina, and urethra, they often suffice perfectly

to prevent a loose uterus from tumbling backwards. In cases, therefore, in which the uterus is easily replaced, and is not unduly large and heavy, Alexander's operation may well be done.

In cases of the second class, namely, those in which the uterus cannot be replaced in a position of anteversion and retained in good position by a pessary, the abdomen should always be opened if it is decided to treat the retroversion by operation. For it is essential in these cases, which are mostly complicated by the chronic results of infective processes, that an exact diagnosis be made. The appendages may require treatment of a more or less conservative nature, they may have to be separated from adjacent structures, and adhesions which bind down the uterus must generally be separated before the organ can be secured in a position of anteversion.

The Trendelenburg position should be used so as to avoid, as far as possible, the placing of sponges or swabs within the abdominal cavity. When the adhesions have been separated, and the appendages have been examined and treated, the operator must decide upon the method to be used for maintaining the uterus in anteversion. Of the innumerable ways devised for securing this object one of the best is doubtless that described by Webster, who pulls a loop of each round ligament through a hole made in the corresponding broad ligament close to the uterus and just below the tube and the ovarian ligament. The two loops of round ligament are made fast by stitches to the posterior wall of the uterus.

If ventrofixation is preferred it may be done as described above for the treatment of prolapse. In many cases, however, there is no great strain on the attachment, the uterus simply requiring something to keep it from tumbling backwards. A mere peritoneal adhesion may be then preferred to firm union with the posterior sheath of the recti. In such cases the sutures which anchor the uterus are made to pass through the peritoneum instead of pushing it on one side. The essential features of the operation are that the attachment is on the anterior uterine wall below the level of the tubes; that there is no tension after the sutures have been tied, and that the wound is so closed as to obviate all risk of hernia. Tension can be avoided if necessary by suturing the uterus to the peritoneum alone instead of passing the sutures through the recti and their anterior fascial covering. Some operators prefer to suture the bases of the round ligaments to the abdominal wall on either side of the wound, and this is said to give very good results.

Summary of Operative Treatment.

Classical Prolapse.

1. Anterior colporraphy with union in the middle line of the parametric and paravaginal tissues; posterior colporraphy and perineorraphy.

2. Ventrofixation in addition to the above, if the anterior colporraphy does not support the uterus in a position of anteversion.

Cystocele and Vaginal Prolapse.

Anterior colporraphy and perineorraphy.

Retroversion demanding Treatment.

A. *Uterus movable.* Alexander's operation as an alternative for pessary

B. *Uterus fixed.* Laparotomy, separation of adhesions, treatment of appendages and securing of uterus in anteversion.

Excretion of Creatinin in Lying-in Women: with some Remarks on Involution of the Uterus.*

By C. Nepean Longridge, M.D. (Vict.), F.R.C.S. (Eng.), M.R.C.P. (Lond.),

Pathologist and Registrar at Queen Charlotte's Hospital.

Apart from the more recent work dealing with the nitrogen partition in cases of toxæmia, the number of observations on nitrogen excretion during the lying-in period is not very great, nor are such observations particularly striking in their results. Winckel found the amount of urea diminished in the first few days in 1865, but this was probably due to alterations in the diet. In 1876 Kleinwächter[1] also found a slight diminution of urea during the first few days. Klemmer,[2] an assistant of Winckel, made some observations on the excretion of urea and the secretion of milk in patients on various diets.

In 1883 Grammatikati[3] published in a Russian journal some observations made upon puerperal patients on a standard diet. He found that the maximum excretion of nitrogen and urea occurred after the beginning of the increased secretion of milk, on the fourth or fifth day, after which there was a fall again. Zacharjewsky[4] made careful observations on lying-in women. The nitrogenous intake was known exactly and the output in the urine, milk and lochia was estimated. He found that nitrogen was laid on during pregnancy, that there was a loss during the first few days of the puerperium, and that nitrogen balance was attained about the end of the first week. The greater part of the nitrogen was found in the urine; the lochia and milk did not account for much as a rule, though as much as 20 per cent. of the nitrogen might be lost in the lochia when the discharge of blood was very free. From eight to nine per cent. was lost in the milk.

Schrader[5] has also carried out some metabolism experiments in connection with pregnant and puerperal women, but he did nothing during the first week of the puerperium.

The present series of observations was made with a view to determining the output of creatinin during the most active period of the involution of the uterus.

The ten patients upon whom the observations were made were

* The expenses of this research were defrayed by a grant from the British Medical Association. The work was carried out in the Research Laboratory of St. George's Hospital.

delivered in Queen Charlotte's Hospital. In every one of these cases labour was normal and the puerperium ran an uncomplicated and an apyrexial course. The patients were placed upon a diet which contained no creatinin,—no meat, soup, fish or beef-tea being allowed. Eggs, milk, porridge, and bread were given. The diet, and its estimated nitrogen-value, was as follows:—

Milk, two pints	6·8	grms.	nitrogen.
Bread and butter, ten ounces ...	3·3	„	„
Eggs, two	2·0	„	„
Porridge ($2\frac{1}{2}$ ounces oatmeal) ...	1·4	„	„
Total ...	13·5	„	„

All the urine passed by the patient from eight o'clock on the first morning after delivery until eight o'clock on the following morning was collected, this constituting the first twenty-four hours' specimen. All specimens were collected between these definite hours, the patients being instructed to empty the bladder shortly before eight in the morning. Although it is desirable, it is hardly practicable to collect the urine by catheter, and therefore during the early days of the puerperium it was sometimes contaminated by the lochia. The urine as it was collected was placed in stoppered jars containing a little chloroform, which were shaken up after each addition to their contents.

The urine on arrival at the laboratory was shaken and the specific gravity determined. Fifty cubic centimetres were then measured into a beaker and boiled with a drop or two of acetic acid to remove all traces of blood and albumen due to lochial contamination. The urine was then filtered and made up to bulk again with distilled water. The total nitrogen was then estimated by Kjeldahl's method, all the determinations being carried out in duplicate. The same burette, flasks and pipettes were used throughout the investigation. Alizarin red was the indicator used.

The creatinin was estimated by Folin's method, always on the same day that the urine was received. Duboscq's colorimeter was employed. The quantity of urine used in making these estimations varied according to the quantity of urine passed in the twenty-four hours, and its specific gravity, in order to bring the readings on the colorimeter scale within the 0·5 and 1·5 limits. Two readings up and two down were taken in all cases, and the average of the four was taken as the basis of calculation. In the first two cases a fixed quantity of urine was used, and the readings were at times outside the limits given above.

The daily average excretion of nitrogen and creatinin in the urine of the ten cases is shown in the following table:—

Day	Urine cc.	Total Nitrogen grammes	Total Creatinin grammes	N. as Creatinin %
1	1650	8·2	0·97	4·2
2	1040	7·8	0·81	3·9
3	980	8·3	0·83	3·6
4	910	8·2	0·70	3·2
5	1100	10·3	0·88	3·3
6	1180	12·4	0·84	2·6
7	950	11·2	0·73	2·9
8	910	10·5	0·85	3·0
9	990	10·2	0·81	3·2

The percentage of the total nitrogen excreted as creatinin is the most valuable column in this table, since it is independent of variations in the amount of urine collected. There is a fall in the figures during the first day or two; this fall is probably due to the fact that the patients had not been placed upon a creatinin free diet for three days before the observations were started, and therefore it is possible that a certain amount of exogenous creatinin was being excreted during the first two days. On the sixth day the low percentage is due to the high excretion of total nitrogen. With these exceptions it is seen that the percentage of the total nitrogen excreted as creatinin remained about 3 per cent. for the whole period. This figure is practically the normal one for the excretion of endogenous creatinin. The column showing the creatinin excretion in grammes does not show any wide variations.

When commencing this research I expected to find the excretion of endogenous creatinin increased owing to the autolysis of the uterine muscle. The result of the enquiry disproves my expectations in this respect, but is in accordance with much of the recent work on creatinin excretion.

Spriggs,[6] working on the creatinin excretion of cases of certain diseases involving the muscles, found that it was "excreted in smaller quantity than the normal when the bulk of muscular tissue is diminished, as in the myopathies; also when muscular activity and muscular tone are depressed by a pathological condition of the muscle or motor apparatus, as in myasthenia gravis and amyotonia congenita. It is unaffected when the muscular tone is lowered by an interference with the sensory path, as in locomotor ataxia. Other workers have failed to show that it is definitely affected by normal muscular contraction, and even in the abnormal activity of tetanus, and of spasticity the increase in its excretion is slight."

Mellanby,[7] at the end of an extended experimental investigation of creatin and creatinin, comes to the conclusion—(1) that in the formation of creatinin, muscle plays a small part; (2) that the liver is intimately connected with the production of creatin and the

excretion of creatinin. In the course of this investigation attention was directed to the question whether creatinin resulted from the autolysis of muscle. Some observers have found such a change, but Mellanby has been unable to confirm their results. He found that "in all autolysis experiments kept rigorously clear of bacterial action, and where precautions were taken to prevent the conversion of creatin to creatinin by heating, creatin and creatinin have remained unaffected." In other words, muscle does not yield creatinin on autolysis. The result of my own investigation is in accordance with Mellanby's conclusion, no increase of creatinin excretion being found during the most active period of autolysis of the uterine muscle.

The excretion of total nitrogen in the urine took a course in these cases which was also unexpected. A glance at the table will show that it rises on the fifth and sixth days, and then falls, whereas on the first four days it remains level. That this is not an accidental result due to striking an average may be seen on referring to the protocols at the end of this paper, in which this rise is found in all but two of the cases. Too much caution cannot be observed in deducing conclusions from results such as these, but it is worth while to discuss certain considerations which they suggest. The alteration in the nitrogen excretion was not due to alterations in the diet, because the patients were taking the same diet containing about 13·5 grammes of nitrogen daily. During the first few days the lochia must account for some of the nitrogen, and when the milk secretion is established a further loss takes place, but since the milk secretion is practically absent during the period when the lochia are most abundant, the two may be assumed to balance more or less. On this assumption the patients were losing five grammes of nitrogen a day in the milk, lochia and other excretions during the first few days.

From the fifth day onwards more nitrogen is excreted, and it seems possible that this extra nitrogen may be derived from the involuting uterus. If this statement, suggested by the figures of the nitrogen excretion, could be proved, we should be in possession of certain very interesting facts bearing upon involution of the uterus.

From the purely clinical point of view there is nothing that is not known about involution of the uterus. W. Williams[8] gives the weight of the uterus after delivery as 1,000 grammes, 500 grammes at the end of the first week, 375 grammes at the end of the second week, and 60 grammes after six weeks. It is a matter of common observation that the process of involution is extraordinarily rapid during the first week. The loss of half its weight in a week as a physiological process is a phenomenon which is peculiar to the uterus. Other organs are occasionally affected pathologically in this way, as, for example, the acute autolytic degradation of the liver in acute

yellow atrophy. But regarded as a physiological process, the first stage of involution of the uterus is absolutely unique.

Therefore during the first and rapid stage of involution there must be some factor at work which does not act later on. This factor is probably the comparative anæmia of the uterus. But the comparative anæmia produced by ligature of the femoral artery in Hunter's canal, does not lead to the leg losing half its weight in a week, and so it is permissible to argue that there is still another factor at work. By applying the knowledge that autolytic degradation of most tissues takes place more rapidly in an acid than in an alkaline medium, it is possible to penetrate further towards the solution of this unique problem.

The work of Helme [9] has hitherto been quoted as the last word on the subject of involution. His work was of a purely microscopic character, and from it he came to this clear-sighted conclusion: "The change is one of physiological retrogression; the actual chemical character is not revealed by the microscope, but it is probable that the cell protoplasm undergoes a sort of peptonization, all the surplus material that is no longer required being changed into some more soluble substance, which finds its way into the surrounding lymph." This prophetic, if somewhat vague, conclusion does not touch upon the essential difference between the first and second stages of involution at all, and it is in this difference that the clue to the "sort of peptonization" is to be found.

I will now proceed to formulate a conception of the process of involution and then to examine the arguments which may be brought against it.

During labour the powerful contractions of the uterus lead to the development of sarcolactic acid in the uterine wall. This acid is neutralized by the circulating blood. When the uterus contracts down after the expulsion of its contents, it is probable that the formation of sarcolactic acid still goes on, but now there is no blood to neutralize it. The uterus is therefore left in a condition of anæmia, and diminished alkalinity, two factors which favour rapidity of autolysis. No recent opportunity of testing the reaction of a normal involuting uterus has offered itself, but the wall of an autolysing uterus removed by the Porro-Cæsarean operation was found thirty-six hours after the operation to be of a distinctly acid reaction. During the first stage of involution when the circulation through the uterus is slight or even completely absent the products of autolysis are retained in the uterus. After four or five days the uterus becomes considerably softened, and the blood begins to percolate more freely through the organ. The products of autolysis are then washed out, and owing to the presence of alkaline blood, the rate of autolysis is very much diminished, and the second or slow stage of involution begins.

This conception was suggested by the table of total nitrogen excretion, but until more facts can be produced to support it, it must remain a conception. However, when one remembers that the patients were kept upon a standard diet during the whole period that they were under observation, it is unlikely that the rise of nitrogen excretion observed practically constantly about the fifth day, was due simply to digestive irregularities. It is possible that this rise is due to the excretion of the products of autolysis which are washed out of the uterus on the re-establishment of the circulation.

The two most obvious objections which can be brought against this theory are clinical objections. Involution, as watched by abdominal measurements, seems to pursue a smooth and regular course from the beginning of the process. If the uterus does diminish in size from the beginning, the idea that the products of autolysis are retained for the first few days would be disproved, but on the question of fact Dakin [10] states that "the size of the uterus does not seem, according to the evidence of frozen sections, to decrease much for the first few days."

The second objection is the fact that during the first few days after labour the lochia are red. Putting aside the question of leakage from lacerations, there is no doubt but that the red lochia are due to oozing of blood from the walls of the uterus, and therefore the uterus cannot be absolutely anæmic in any case in which the lochia are red.

But is it necessary for the lochia to be red? The conclusion that a thing is right and proper because it is the customary thing is an argument the fallaciousness of which is at once demonstrated when we remember that forty years ago any wound which healed by first intention was looked upon as something rather uncanny.

In no other mammalia does a discharge comparable to the red lochia of the human female take place. In mares, where the arrangement of the placenta is similar to that of the human race, nothing more than a slight discharge of colourless mucus is found after parturition. Therefore red lochia may be looked upon as one of the "disharmonies" of nature as Mechnikoff [11] called them.

It is not in accordance with accepted surgical principles to leave a surface oozing, and I can state from personal experience, and no doubt it is not an uncommon experience, that some patients have practically no lochial discharge at all except a slight flow of mucus. Therefore it is possible for the human uterus to be absolutely "blood-tight" after parturition.

The complete hæmostasis occasionally found after labour is probably secured in two ways. Firstly, by the retraction of the uterine muscle, and, secondly, by the kinking of the uterine arteries. These kinks may not entirely stop the flow of blood through the arteries, but they reduce the pressure of the blood as it reaches

the uterine wall. It is difficult to conceive that the blood reaching the wall of a merely retracted uterus at the normal pressure would not force its way through, and were it not for the reduction of the pressure by the kinking of the arteries, it would probably do so.

A remarkable case of superinvolution of the uterus was recorded by Whitehead,[12] in which the uterus completely disappeared. The patient was an anæmic woman, and after the birth of her last child she had post partum hæmorrhage. After the cessation of the flooding "the discharge does not appear to have had the ordinary character of lochia, but to have consisted of a brown watery fluid, which persisted for a couple of weeks without any change in its appearance." Menstruation was never re-established. In this case it is possible the uterus was absolutely anæmic after delivery; the circulation was never re-established, and the uterus underwent rapid autolysis, the products of which appeared in the brown watery fluid which took the place of the normal lochia.

The author wishes to thank the physicians of Queen Charlotte's Hospital for permission to use their cases, and Dr. E. I. Spriggs for much kindly advice and help.

Protocols.*

Case 1.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Oct. 15	600	1034	5·85	0·81	0·30	5·1
„ 16	580	1030	5·46	0·67	0·24	4·6
„ 17	400	1040	5·29	0·67	0·25	4·7
„ 18	450	1034	7·78	0·61	0·23	3·0
„ 19	350	1032	4·77	0·59	0·21	4·8
„ 20	350	1034	5·87	0·54	0·20	3·4
„ 21	210	1038	3·67	0·33	0·12	3·38
„ 22	320	1036	5·44	0·54	0·20	3·69
„ 23	400	1030	3·70	0·54	0·20	5·5

Case 2.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Oct. 15	1160	1006	4·31	0·58	0·20	4·8
„ 16	270	1028	3·37	0·39	0·14	4·3
„ 17	800	1024	7·51	0·75	0·27	3·7
„ 18	900	1020	8·21	0·47	0·17	2·1
„ 19	1250	1020	9·33	0·85	0·31	3·4
„ 20	900	1016	7·01	0·65	0·24	3·4
„ 21	410	1024	4·99	0·42	0·15	3·2
„ 22	600	1022	5·94	0·61	0·22	3·8
„ 23	500	1024	4·34	0·54	0·20	4·6

* The figures in the columns under Total Nitrogen, Total Creatinin, and Nitrogen as Creatinin represent grammes.

Case 3.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Nov. 8	2100	1012	13·05	1·53	0·57	3·7
„ 9	1000	1012	5·45	0·60	0·22	4·0
„ 10	1550	1012	11·19	1·21	0·44	4·0
„ 11	1205	1014	6·54	0·88	0·32	5·0
„ 12	1200	1022	12·18	1·18	0·44	3·6
„ 13	1600	1016	17·77	1·47	0·54	3·0
„ 14	1200	1018	12·86	1·12	0·41	3·2
„ 15	1000	1025	14·37	1·17	0·43	3·0
„ 16	1000	1012	9·02	0·70	0·26	2·8

Case 4.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Nov. 8	2000	1006	8·24	1·15	0·42	5·2
„ 9	1500	1012	9·48	1·19	0·42	4·4
„ 10	1000	1012	6·64	0·80	0·29	4·4
„ 11	910	1016	7·86	0·89	0·33	4·2
„ 12	900	1020	9·76	0·90	0·33	3·4
„ 13	1700	1012	14·11	1·02	0·38	2·7
„ 14	1600	1012	11·92	1·03	0·38	3·2
„ 15	1400	1012	13·42	1·15	0·42	3·1
„ 16	1050	1020	12·32	1·05	0·38	3·1

Case 5.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Nov. 18	1400	1012	7·57	0·90	0·33	4·4
„ 19	1400	1010	7·30	0·79	0·29	4·0
„ 20	1050	1010	5·14	0·39	0·14	2·8
„ 21	1600	1012	11·32	0·64	0·23	2·0
„ 22	2000	1012	14·24	0·83	0·30	2·1
„ 23	2200	1010	15·95	0·67	0·25	1·6
„ 24	1250	1010	8·34	0·42	0·15	1·9
„ 25	*500	1022	8·40	0·42	0·15	1·8
„ 26	1400	1014	13·79	0·94	0·35	2·5

Case 6.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Nov. 18	2500	1010	7·17	0·96	0·35	5·0
„ 19	900	1020	5·85	0·89	0·33	5·6
„ 20	550	1024	5·19	0·46	0·17	3·3
„ 21	700	1022	7·28	0·67	0·25	3·4
„ 22	1000	1022	10·8	0·91	0·33	3·1
„ 23	1000	1022	10·55	0·80	0·29	2·8
„ 24	1000	1020	10·16	0·81	0·30	3·0
„ 25	1300	1012	10·42	0·87	0·32	3·1
„ 26	900	1016	7·34	0·68	0·25	3·4

Case 7.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Nov. 30	1050	1018	9·68	0·52	0·19	2·0
Dec. 1	1900	1016	17·74	1·46	0·54	3·0
„ 2	1400	1020	13·57	1·12	0·41	3·0
„ 3	1200	1016	9·26	0·73	0·27	2·9
„ 4	Urine thrown away.					
„ 5	900	1022	11·81	0·87	0·32	2·7
„ 6	1150	1020	16·21	0·97	0·36	2·2
„ 7	1350	1020	12·70	0·90	0·33	2·6
„ 8	1260	1016	13·40	0·68	0·25	1·9
„ 9	940	1016	9·54	0·75	0·27	2·8

Case 8.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Nov. 30	2000	1010	9·29	0·70	0·76	2·8
Dec. 1	1300	1012	12·19	0·92	0·34	2·5
„ 2	1100	1020	10·99	0·93	0·34	3·1
„ 3	800	1030	10·40	0·86	0·32	3·0
„ 4	800	1030	11·26	0·83	0·30	2·7
„ 5	700	1024	9·87	0·56	0·20	2·0
„ 6	1250	1014	13·00	—	—	—
„ 7	1240	1016	13·00	0·88	0·32	2·5
„ 8	1500	1016	13·80	0·75	0·27	2·0
„ 9	1000	1018	11·30	0·77	0·28	2·5

Case 9.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Dec. 13	870	1018	7·96	0·95	0·35	4·4
„ 14	840	1016	5·55	0·59	0·22	4·0
„ 15	1020	1020	9·01	0·93	0·34	3·8
„ 16	400	1030	6·18	0·56	0·20	3·3
„ 17	1120	1020	10·65	0·97	0·36	3·4
„ 18	1300	1024	18·70	1·07	0·39	2·1
„ 19	500	1024	8·09	0·57	0·21	2·6
„ 20	500	1026	8·19	0·65	0·24	3·1
„ 21	900	1024	12·60	1·11	0·41	3·2

Case 10.

Date.	cc. urine.	Sp. G.	Total N.	Total C.	N. as C.	% as C.
Dec. 13	2800	1010	10·3	1·40	0·52	5·0
„ 14	800	1014	6·54	0·62	0·23	3·5
„ 15	1000	1022	9·70	1·09	0·40	4·0
„ 16	1010	1018	7·66	0·75	0·28	3·6
„ 17	1300	1014	10·42	0·94	0·35	3·4
„ 18	1200	1020	12·70	1·09	0·40	3·2
„ 19	1000	1019	13·70	0·97	0·33	2·4
„ 20	910	1024	12·94	1·31	0·48	3·7
„ 21	1000	1020	11·92	1·12	0·41	3·5

REFERENCES.

1. Kleinwächter. *Arch. für Gynäkol.*, 1876. Bd. 9, S. 370—395.
2. Klemmer. *Berichte u. Studien aus dem k. sächs Sutbindungsinstitut in Dresden*, 1876. Bd. 2, S. 155—186.
3. Grammatikati. Quoted by Zacharjewsky.
4. Zacharjewsky. *Zeit. für Biologie.* Vol. xxx, p. 368.
5. Schrader. *Arch. für Gynäkol.*, 1900. Hft. iii, p. 534.
6. Spriggs. *Quart. Journ. of Med.*, 1907. Vol. i, No. 1.
7. Mellanby. *Journ. of Phys.*, 1908. Vol. xxxvi, p. 486.
8. Williams. *Obstetrics*, p. 301.
9. Helme. *Trans. Roy. Sos., Edin.* Vol. xxv, Part ii, p. 359.
10. Dakin. *Manual of Midwifery*, p. 213.
11. Metchnikoff. *Nature of Man.*
12. Whitehead. *B.M.J.*, Oct. 12th, 1872. Vol. ii, p. 408.

SELECT CLINICAL REPORTS.

(Under this heading are recorded, singly or in groups, cases to which a special interest attaches either from their unusual character or from being, in a special sense, typical examples of their class).

I.

A Case of Generally Contracted Flat Reniform Pelvis with Slight Scoliosis (Conj. Vera=2½ in.). Induction of Premature Labour in 32nd week; Forceps; Child in good health 16½ years later.

By Francis Henry Champneys, M.A., M.D. (Oxon.), F.R.C.P.,

Physician Accoucheur to St. Bartholomew's Hospital.

M.H., æt. 34. Housewife. Admitted to St. Bartholomew's Hospital on July 29th, 1891, for pregnancy with contracted pelvis.

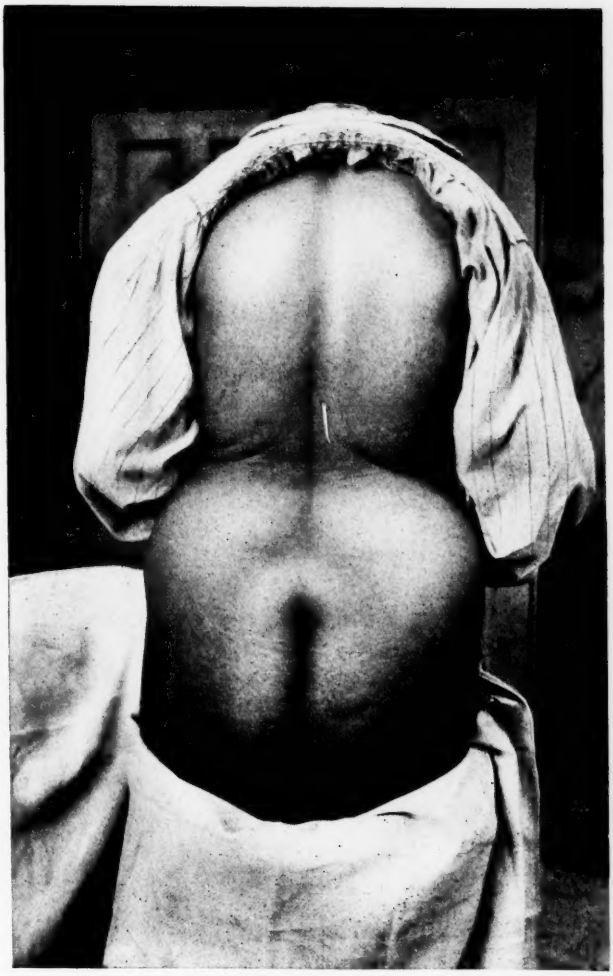
Past history. Very delicate as a child, backward, late in cutting teeth and in walking; suckled by her mother. Rheumatic fever 15 years ago, good health since then.

Married 3 years. Pregnancies=1. Craniotomy at full time. Catamenia began æt. 14, regular every 28 days, duration 6–7 days; last regular period January 2nd, 1891.

On admission. Healthy-looking woman, very short, 4 ft. 6 in. in height. Spine shows a slight lateral curve to the left in the upper dorsal region, to the right in the dorso-lumbar region, and to the left in the lumbo-sacral region. The ribs come very near to the iliac crests. Clavicles not affected, arms short, legs short, femora and tibiæ, especially the latter, curved forwards; marked genu valgum on both sides.

The photograph, kindly taken for me by Mr. B. T. Lang, House Surgeon to St. Bartholomew's Hospital, shows the back very well, and especially the great shortness of the dorso-lumbar region. The vertical length from the wrinkles marking the summits of the ilia to the bottom of the nates is as great as that from the same wrinkles to the shoulders.

Pelvis. Ilia small.
Spp. Il.=10¼ in.
Crr. Il.=10¼ in.
Conj. ext.=6¼ in.



Back view of M. H. showing relative shortness of dorso-lumbar spine, somewhat as in spondylolisthesis.

Per hypogastrium. Height of fundus=3½ in. below ensiform cartilage. Small parts to the left and above. Back to the right. A round hard body like the head felt well above the pubes. Symphysis not deep.

From symphysis pubis to navel	=5½ in.
From ensiform cartilage to navel	=6¼ in.
From right ant. sup. spine to navel ...	=7½ in.
From left ant. sup. spine to navel ...	=7½ in.
Circumference at navel	=35 in.

Fœtal heart heard midway between right ant. sup. spine and navel.

Per vaginam. Cervix very high up. Promontory of sacrum decidedly to the left. Sacrum straight from above downwards, and very convex from side to side, especially at the intervertebral discs (rickets). Diagonal conjugate=3¼ in. True conjugate estimated at 2¾ in. A round movable part like the head felt at the brim, which does not attempt to enter it. There is considerable transverse contraction.

Treatment. It was decided to induce labour (N.B., A.D. 1891). From August 4 to 10 attempts were made to do this by means of laminaria tents, and afterwards by bougies.

On August 11, at 9 p.m., pains began.

August 12, at 7-30 a.m., the waters escaped. At 12-30 p.m. the cervix, still undilated, was dilated by the fingers.

August 13, 2-30 p.m., patient was seen by Dr. Champneys, and it was decided to attempt delivery by axis-traction forceps. The head was in the second position, floating high above the brim. Dr. Champneys pressed the head down on the brim, but the uterus was so inert that a fold of the uterine wall at first intervened between the head and the brim. He then arranged the position of the head as he desired, that is, with the occiput to the right and a little behind (reniform pelvis with left scoliosis), and gave it to an assistant to hold. He then applied the forceps, using the right blade somewhat behind the occiput, and the left blade somewhat in front of the sinciput (the blades thus occupying a position approaching the right oblique diameter of the pelvis) The blades were locked, and the head extracted with very little force. When the head emerged the blades were seen to be at the sides of the head, which had rotated inside them. The child was born at 2-40 p.m.; it required a few minutes' artificial respiration, and was then placed in an incubator.

The placenta was expressed entire at 2-50 p.m. The uterus contracted well after a hot douche. At 4 p.m. the patient shivered for ten minutes.

After delivery the true conjugate was measured directly by the hand, and found to be 2½ inches. The transverse diameter of the brim was 4¼ inches.

Child, female; weight (20 hours after delivery) = $4\frac{1}{4}$ lbs.
Measurements of head:—

Occipito-frontal	= $3\frac{3}{4}$ in.
Occipito-mental	= $4\frac{1}{2}$ „
Cervico-bregmatic	= $3\frac{1}{2}$ „
Suboccipito-bregmatic	= $3\frac{1}{4}$ „
Bitemporal	= $2\frac{1}{2}$ „
Biparietal	= 3 „
Vertico-mental	= $4\frac{1}{2}$ „

Mother and child progressed well; the mother got up on the tenth day.

On February 11, 1908, mother and child were seen by Dr. Fairbairn, whom I asked to confirm or correct the pelvic measurements. He was able to confirm them.

The child is now $16\frac{1}{2}$ years old, is 5 ft. 4 in. high, well grown, in good health and intelligent, being a chemist's assistant.

Remarks.

This case is recorded, not as an example to be followed in 1908, but as a history of what actually happened in 1891.

At this time Cæsarean section was feeling its way, and could not be advised with the confidence with which it can now be recommended. At the present time I should certainly perform Cæsarean section. But, putting that question aside, there were certain favourable elements in the pelvis, namely, its reniform shape (providing something like a bay on the right side), and the left scoliosis (which helped to widen this still more). Everything depended on securing the best possible position for the head (in this case with the occiput to the right side and a little behind, or in the 3rd vertex position).

The next point was the exact application of the forceps. Had the rule " when the head is high apply the blades simply to the sides of the pelvis " been followed, most probably the child would have lost its life.. I have always been strongly of the opinion that this rule is a bad rule, and that it leads to " rule of thumb " and paralysis of thought. No doubt when the head is above the brim the blades cannot be applied solely with regard to the sides of the head; but this relation should never be ignored. Suppose the head to be transverse at the brim, if the blades are applied simply with reference to the sides of the pelvis, they never (as a matter of experience) occupy this position, but are always somewhat oblique If they are oblique with regard to the head they are bound to produce a couple of forces and to cause rotation of the head. This rotation will either be in the right or in the wrong direction.

If the blade applied to the occipital end is placed at all *in front* of that end (and the other blade at all behind the frontal end), the action of the blades will be to produce posterior rotation of the occiput (occipito-posterior or face-to-pubes).

If, on the other hand, the blade applied to the occipital end is placed a little *behind* that end (and the other blade a little in front of the frontal end), the action of the blades will be to produce anterior rotation of the occiput, which is the object desired.

Relaxation of the blades between the pains relieves pressure on the head, and allows it to rotate gradually within their grasp, as happened in this case, after the head had passed the brim.

The rule should be *in all cases* to remember the position of the head and its proper rotation, and to favour this movement by intelligent application of the blades. I have always taught this in my lectures for the last twenty-six years, and have found it confirmed abundantly in practice.

Von Winckel puts the same principle briefly as follows:— "Even if the head stands transverse in the pelvic inlet, it is absolutely necessary, according to my experience, to apply the blades of the forceps to the oblique diameter, which means that they are to be introduced, in a first position of the head, on the left side behind and on the right in front; in a second position, on the right side behind and on the left in front."

In cases in which the head comes through the brim and lies in the cavity with the occiput at all behind, the proper course is to re-apply the blades with reference to the sides of the head, and thus to favour its forward rotation.

Podalic version would almost certainly have ended in stillbirth. Had a footling delivery become for any reason inevitable the only chance would have been for the occiput to occupy the right side of the brim. This would have been secured by bringing down the right leg, since the leg which comes down rotates to the front.

Chorea During Pregnancy.

By Wm. Fletcher Shaw, M.D.,
Resident Surgical Officer, St. Mary's Hospital, Manchester.

Many valuable papers have been written on this subject during the last few years, commencing with Buist's excellent resumé of all the published cases up to 1895; but there is still great divergence of opinion as to the causation and the best method of treatment of this somewhat rare and serious complication of pregnancy.

Buist, in 1895, considered the predisposing causes to be previous chorea, hysteria, shock, rheumatism, infective processes during the puerperium, and insanity.

Wall and Andrews, in 1903, came to the conclusion that this complaint is determined by mental worry, overstrain or shock, but the determining cause is only effectual when it acts upon a brain whose power of control is somewhat lowered by the pregnant state, and in addition is unstable in consequence of (1) antecedent chorea; (2) antecedent rheumatism or other debilitating condition; or (3) a defect in development.

In 1903 Sir Dyce Duckworth published a paper in which he considered toxæmia to be one of the basic elements of this complaint. Pregnancy, *per se*, does not figure in the etiology of chorea, and neither shock nor intense emotion, by themselves, are provocative of it.

French and Hicks, in 1906, considered the neurotic manifestations to be the result of rheumatic toxæmia, and not due to nervousness of disposition, anxiety, fright or worry, which they did not consider could actually produce chorea, although they might accentuate the choreic movements if produced by other causes.

Taylor, in his well-known text-book of medicine, states that chorea gravidarum is primarily due to a toxæmia, his reasons being (1) frequent occurrence of endocarditis and its almost universal presence in fatal cases; (2) association of rheumatic fever and other infectious diseases; (3) mode of death: this is not explained by muscular exhaustion.

These authors have been gradually leading up to the point of considering chorea gravidarum to be due entirely to a toxæmia, although none of them have advocated treatment on these lines.

In 1907 I published eleven cases,[1] nine of which had been treated on anti-toxæmic lines, with the happiest of results both to mothers

[1] *Journ. of Obstet. and Gynæcol. of Brit. Empire*, April 1907. This paper contains references to literature subsequent to Buist's paper.

and children. I now publish the notes of three further cases which have been successfully treated in the same way, making now twelve consecutive successful cases.

The great peculiarity of chorea is that it only occurs in two periods of life—childhood and pregnancy, being very rarely seen at any other time.

In babyhood the higher controlling centres are very imperfectly developed, so that the whole nervous system, at this age, is in an unstable, irritable condition, and makes the infant especially prone to convulsions, &c., which become less common as age advances.

As the child grows older the condition of its nervous system becomes more stable unless the child suffers from heredity instability, ill-health, disease, privation or other conditions which will retard the child's development and cause its nervous system to retain its infantile type. Such a child may possibly develop chorea, the causal factor often being fright, which in a healthy child would have no permanent effect.

During pregnancy, the only other condition in which chorea occurs, the controlling powers of the higher centres are probably lowered by the toxæmia of pregnancy, and the whole nervous system reverts to the condition in infancy. This heightened irritability of the nervous system is manifested by all those neurotic conditions which are so common during pregnancy, bad temper, neuralgia, pruritis, amblyopia, peripheral neuritis, &c., and it is easy to conceive that a shock or fright, which in ordinary health would cause no effect, might now cause serious nervous affections such as chorea.

Case I. M.D., aged 18, a primigravida, 7 months pregnant, was admitted to St. Mary's Hospital on November 21st, 1907, under the care of Dr. Donald.

She was an unmarried girl, and had had a considerable amount of trouble and worry, as the father of the child, who had promised to marry her, had died six months previously. She said the twitching had commenced suddenly three months before admission; she had been much troubled with sickness, but sleep was unimpaired. As a child she had had chorea, and had been unable to walk for some time.

On admission, she was seen to be a thin, very delicate-looking girl, with choreic movements in every limb; these movements were sufficiently severe to prevent her from drinking out of a cup, but ceased during sleep.

After admission, she was kept in bed, and the bowels were well and regularly moved with magnesium sulphate and calomel: a simple saline diaphoretic and diuretic mixture was given, and the diet restricted to malted and peptonized milk on account of the sickness, which occurred frequently during the first four days. After this time

she was allowed milk foods as the sickness had ceased and the choreic movements were much less. By November 30th, nine days after admission, all the movements had ceased, and the diet was increased to fish and chicken, being finally extended to "ordinary diet," without tea or coffee, on December 10th. From this time forwards she had no choreic movements, her strength increased, and she was delivered of a living female child on January 23rd, 1908, both mother and child being discharged in good health on February 2nd, 1908.

Case II. R.E., a primigravida, aged 21, was admitted to St. Mary's Hospital on December 18th, 1907, under the care of Dr. Walter.

She said the choreic movements suddenly commenced when she was four months pregnant, two weeks after her marriage; she had not previously had either chorea or rheumatism.

On admission, she was a pale, delicate-looking girl, $4\frac{1}{2}$ months pregnant, with severe choreic movements affecting her head and all her limbs, but being most marked in her arms.

After admission, she was kept in bed, calomel and a simple saline diuretic and diaphoretic mixture were administered, and the diet restricted to barley water and milk. It was not until the third day that the bowels were satisfactorily moved, during which time the patient slept little and the movements did not improve. After the bowels had been well moved she slept well and the movements were much less.

Ten days later, the choreic movements having almost ceased, she unfortunately developed an attack of pneumonia, which brought on labour, a still-born fœtus being delivered twelve hours after the sudden rise of temperature. The pneumonia was followed by an empyema, and, as this did not clear up after exploration and drainage, she was sent to the Manchester Royal Infirmary.

She eventually made a good recovery, with no recurrence of the chorea.

Case III. E.D., a primigravida, aged 23, was admitted to St. Mary's Hospital on December 20th, 1907, under Dr. Walter.

She gave a history of chorea when 13 years of age, but not so severe as this attack, which commenced two months before admission; she had been married seven months, and her husband was out of work.

She was a well-developed, well-nourished woman, 7 months pregnant, with choreiform movements affecting her head and all her limbs. These movements were so severe that one nurse could not keep her in bed, and on three occasions, when left for a few moments with only one nurse, she fell on to the floor. She had not slept for three nights previous to admission, and it was for this reason,

combined with the fact that she had become steadily worse, that her doctor had sent her into St. Mary's Hospital.

After admission, she was kept in bed, on milk diet and calomel gr. i was administered 4-hourly. After two days of this treatment she was much worse, she had not slept at all, the movements were excessively violent and she had delusions. Her bowels not having been very satisfactorily moved, more calomel and an oil enema, followed by a copious simple enema, were administered with good results. Normal saline, a pint every four hours, was administered 4-hourly per rectum. Thyroid extract gr. v was also given 4-hourly, and

℞ Liquor. ammon. acet. ʒii
Sp. æth. nitrosi ♏xv
Aquam ad ʒss

given every two hours.

After 24 hours of this treatment the patient fell into a *natural* sleep, which lasted 16 hours, after which she was so much better that she could drink a cup of milk, holding the cup herself. For the next 24 hours she slept almost constantly, being only roused for food and medicine. The thyroid and the saline per rectum were withdrawn after 48 hours' administration, the movements having almost ceased.

From this time she steadily improved, the movements being quite absent in a fortnight, and were very slight after the first week.

On February 9th, 1908, she was confined of a healthy male child, both being discharged in good health on February 22nd.

On February 11th and 12th she had a rise of temperature, due to an attack of influenza.

Four days after the commencement of the more vigorous treatment there was a great increase in the quantity of urine passed, 66 oz. in 24 hours as against 20 oz. when first admitted, accompanied by a great increase in the output of urea and uric acid, the latter being especially marked.

Treatment. The treatment advocated by most authors is to keep the patient in bed, to keep up her strength by nutritious diet, to procure sleep, and to administer arsenic, zinc and salicylates. On the question of terminating the pregnancy, opinion seems to be pretty evenly divided. Duckworth, Hellier and Williamson advocate it; Walls and Andrews, French and Hicks oppose it.

The first two cases of the series which I previously published were treated on traditional lines, abortion being finally procured after persevering with the treatment for one week and two weeks respectively; both ended fatally to mother and child.

The following nine cases of that series and the three published above were treated on anti-toxæmic lines, with the best of results.

Our routine treatment now is to keep the patients quiet in bed,

on a diet restricted entirely to milk, until the movements show signs of improvement, when the diet is very gradually increased, always returning to the milk if there is any increase of the symptoms. Elimination by the skin and kidneys is encouraged by administering a simple saline diaphoretic and diuretic mixture, and the bowels are kept well opened by calomel or jalap.

For most patients this is sufficient, but occasionally a very severe case, such as No. 3 above, will not respond to it. In this case the saline mixture was given much more frequently; the bowels were strongly acted upon by a large dose of calomel, followed by an oil and copious simple enemata; a pint of normal saline solution was also administered per rectum every four hours; and thyroid extract gr. v was given by the mouth 4-hourly. Although this patient had not slept at all during the previous five days and nights, after 24 hours of this treatment she fell into a *natural* sleep which lasted 16 hours, awaking then in a much better general condition and with the choreic movements markedly lessened.

One of the strongest proofs that this treatment is conducted on rational lines is the fact that in none of our twelve consecutive cases have any hypnotics been administered. So soon as elimination is increased, as shown by an increase in the output of urea and uric acid although the diet is restricted to milk, natural sleep occurs, generally on the second or third night.

Induction of labour appears to be strongly contra-indicated, the only two maternal deaths which we had in the series of 14 cases being in the only two cases in which labour was induced.

Results. As previously stated, our first two cases were treated on traditional lines and labour was induced finally, both mothers and children perishing. The remaining twelve cases (nine in the previous series and the three cases above) were all treated as described above; all the mothers made excellent recoveries, and the results to the children were equally gratifying as all, except two, were born healthy, or the mothers discharged as cured before delivery and with the fœtal heart audible. Of the two still-born children, one was due to an accident at birth, the fœtal heart being audible a short time previous to delivery; in the other case, No. 2 of this series, the mother developed pneumonia, after the chorea had much abated, which caused her to be prematurely delivered of a still-born child.

The conclusions I previously arrived at which are confirmed by these three cases are:—

(1) The chorea of pregnancy is due to a toxin which appears to be identical with, or closely to resemble, that of acute rheumatism.

(2) It affects human subjects under two circumstances, both of these being characterized by instability or irritability of the nervous system, namely, childhood and pregnancy.

(3) The cause of the instability or irritability of the nervous system in pregnancy, bringing it down to the level of childhood, is the toxæmia of pregnancy.

(4) In the chorea of pregnancy, therefore, it is more important to remove the predisposing cause than to apply merely symptomatic treatment.

(5) The treatment must be eliminative as in the other toxæmias of pregnancy.

(6) The pregnancy should not be arrested as a rule, as this is generally unnecessary and harmful to the patient as well as to the child.

Some Modern Maternity Hospitals, with Illustrations.

IV.

GLASGOW MATERNITY AND WOMEN'S HOSPITAL.

Before describing the new buildings which were formally opened on Wednesday, 29th April, by Her Grace the Duchess of Montrose, it may be interesting to refer briefly to the history of this charity.

The Hospital had its origin in a small house in Grammar School Wynd in the year 1734. In 1841 it was transferred to another dwelling house in St. Andrew's Square. In 1760 the number of patients making application for admission to the Hospital had increased to such an extent that a larger house was purchased in Rottenrow, where the work was carried on for the next twenty years. More accommodation still being required, the Directors built a Hospital on the same site. This building will be retained and used for Gynæcological cases. The number of patients treated and the number of students studying in the Hospital has been steadily on the increase, as the following figures demonstrate very clearly:— In 1860 the number of patients in the Indoor and Outdoor departments was 994; in 1880, 1,288; in 1907, 3,740. The amount of fees drawn from the students and nurses in the early years of the Hospital was under £100; in 1880, £261; in 1907, £1,158.

For some years the number of cases seeking admission to the wards has been far in excess of the accommodation, and cases requiring hospital treatment have had to be dealt with in their homes for want of room in the Hospital. The Directors were impressed with the great need for a larger Institution, and acquired some properties adjoining the older building, in order that they might build and equip a modern Hospital, not only for the treatment of patients, but for the teaching of practical Obstetrics and Gynæcology. Mr. R. A. Bryden was appointed Architect, but before the plans were completed, the Directors commissioned Dr. D. J. Mackintosh, Superintendent of the Western Infirmary, and two members of the Visiting Staff, Dr. Jardine and Dr. Munro Kerr, along with Mr. R. A. Bryden, to visit the principal Maternity and Gynæcological Hospitals at Home and on the Continent, in order that the new Hospital might embody the latest and best features for the treatment of Maternity and Gynæcological cases. The deputation visited the leading Hospitals in this country, and also inspected similar Institutions in Paris, Basle, Freiburg, Heidelberg, Halle, Leipzig, Dresden, Berlin and Hanover. Upon the experience thus gained the new Hospital has been designed and equipped.

The new buildings are situated at the top of Montrose Street,

fronting that thoroughfare and Rottenrow. The ground to the South from Rottenrow falls at a very steep gradient, and this necessitated very considerable formation of site and erection of substantial retaining walls to carry the buildings on the higher level. The site measures 250 feet long by 207 feet broad, and is bounded on the North by Rottenrow, on the West by Montrose Street, and on the South by Ure Place. The buildings generally follow the lines of the streets, and as the ground falls very suddenly to the South this allows of two floors being formed on the Southern portion of the buildings, below the ground floor on the level of the Rottenrow. Externally the building has been treated in a free and simple manner, and without ornamentation. The elevations to Montrose Street and Rottenrow are of white sandstone, and the walls to the South and East fronts and of the inner court-yards are faced externally with white glazed brick. Special attention has been paid to the finishing of the interior, and every effort has been made to avoid crevices where dust could lodge. The sanitary fittings are of the modern type, and some of them have been specially designed for this building.

Description of Plans.

Ground Floor Plan with Admission Department. For convenience of description we will begin with the ground floor plan. Patients seeking admission to the Hospital enter by the main entrance on the level of Rottenrow. Here there is a covered carriage way, which permits of patients being removed from the Ambulance without being observed from the street. On the right of the vestibule is the porter's room and enquiry office, with telephonic exchange adjoining. To the right of the entrance hall is the admission department, and on the left is a free air space which cuts off the Isolation Block. When a patient arrives she is taken into the waiting room, where the necesary particulars regarding her are ascertained. She is then examined in the preliminary examination room, and if found a suitable case for admission to the General Maternity Wards, is taken to the undressing room, situated on the opposite side of the corridor, then to the bathing room, and thereafter to the examination room proper. Should it be found in the preliminary examination room that the patient is not suitable for the General Maternity Wards, she is immediately transferred to the Isolation Block. The admission department has been designed so that an unsuitable case is at once detected, and cannot gain admission to the Maternity Wards. In the north-west corner of the building there is a large Lecture Theatre occupying two stories in height, and giving accommodation for 90 students. The patient and lecturer enter the theatre from the sub-basement level, and the students enter the gallery on the level of the ground floor. On this

flat there are five wards containing from 4 to 8 beds, with the necessary lavatory accommodation, ward kitchens, etc. A covered gangway connects the entrance hall with the south block of buildings, in which is placed the resident's dining room, dispensary, and visiting physicians' room. In the different angles of the building are four wide staircases, having electric lifts associated with three of them. These are worked on the "push button" system of control, and are large enough to accommodate a bed and two attendants.

Basement Floor. This is principally for administrative purposes. Below the entrance hall and admission department are a museum, laboratory, and private investigation room. In the south-west corner is the nurses' sitting room, with a small room for nurses' visitors adjoining. In the centre block is the nurses' dining room with servery attached containing an electric push-button service lift communicating with the kitchen below. The east wing contains nurses' bedrooms. These consist of single rooms, simply but tastefully furnished.

The Sub-Basement contains in the west wing servants' bedrooms and servants' dining hall. In the centre block there is a well-equipped kitchen and general stores, and in the east wing a patients' clothes store, an up-to-date laundry and washhouse, and a special washhouse where all linen from the isolation block is treated. Linen coming from the isolation block is first of all put into this washhouse where the linen is steeped in large fire-clay tubs, then boiled before being passed through to the general washhouse. As the entrance to this special washhouse is at some distance from the entrance to the general washhouse, it is scarcely possible for the linen in this department to get mixed with that of the other part of the establishment.

First Floor Plan. In the centre of the north block and reached by a private corridor are placed the resident physicians' quarters, consisting of a sitting room and 3 bedrooms with a bathroom. To the west of these rooms is the Matron's apartments consisting of a sitting room, bedroom and bathroom, but entering from a private lobby. In the west wing are placed 2 labour rooms, a large one for 4 beds, and a smaller one for 2 beds. These rooms are beautifully lit, the walls are tiled to the ceiling, and the floors are formed in terrazzo. Placed between these labour rooms, is a sterilising room, robing room, and a room for the sister in charge. These labour rooms are equipped on the lines of a modern operating theatre. In the south-west corner of this flat is a ward of 7 beds with nurses' duty room attached. There is a corridor glazed on both sides which leads to the east block of buildings where there are two wards each containing 8 beds, with lavatory accommodation, Nurses' duty room and ward kitchen.

Second Floor Plan contains a series of wards of various sizes accommodating from 2 to 8 patients. In the south-west corner are the nurses' bedrooms, similar to the flat below. In addition to the accommodation for patients in this flat there is a room for bathing children. This room has tiled walls and terrazzo floor with a gutter running along the sides, and hot and cold water taps supplying small portable baths, which are placed round the room. The room is specially heated by radiators, and in addition there is an open fire.

Third Floor. The third floor contains the operating theatre in the north-west corner, and bedrooms for Nurses in the south-east block. The operating theatre has a magnificent north light which is arched over the ceiling, as well as a large window to the west. The gallery is formed in terrazzo and gives accommodation for 60 students, each student having a lifting seat. The walls are tiled to their whole extent. All supply pipes pass through the walls direct to the fittings, so that there are no exposed pipes in the walls of the theatre. Adjoining the theatre is an anæsthetic room, sterilizing room, room for preparing surgical dressings, and robing room. The students reach the gallery by a separate staircase without coming in contact with the patient.

Isolation Block. The necessity of having a special department for the treatment of cases which might from their character be harmful to other patients in the ordinary Maternity wards has been well appreciated, and an isolation block has been provided in the north-east corner of the site fronting Rottenrow. This department is completely cut off from the Hospital proper by a ventilating corridor on the ground floor, while the upper flats have no communication whatever with the rest of the building. The first floor of this isolation block contains a ward of 7 beds and a smaller ward to accommodate a single bed, with apartments for the resident doctor. The second floor provides for other 8 patients, while on the top there is a well-equipped operating room and an anæsthetic room adjoining. The operating room is lit from the north and is similar to the larger operating room in the main buildings. Entering from a separate corridor on this flat are four bedrooms with the necessary bathroom and lavatory accommodation for the nurses employed in this department.

The heating throughout the building is on the "Reck" system, by means of which hot water is rapidly circulated through the radiators. In the wards and corridors radiators are placed in the bossings of the windows, and in nearly all the wards there is, in addition, an open fire. An abundant supply of hot water is got from a set of calorifiers which are quite independent of those used for heating the building. Owing to the great height of the building and possibility of the city gravitation water not reaching to the top

floor at certain parts of the day, cisterns have been placed at different points of the roof. A large cold water cistern has been set on the roof of the western end of the building, and another one at the top of the eastern wing. These tanks are on the same level and are connected by a pipe passing down through all the floors and along the ceiling of the basement corridor. By this arrangement should one cistern be under repair a sufficient water supply will be maintained all over the building by the other until the repairs are completed, but generally the water supply will be from the "main." Although all the floors of the building are fire-proof, fire-hose hydrants, as well as numerous hand extinctors are provided, so that even a small outbreak of fire may be quickly checked. The building throughout is lit by electricity, and the fittings are of the simplest type. Electricity is also the motive power for the laundry and wash-house machinery, as well as for the lifts. Special electric fittings have been arranged in the operating-room on a telescopic arrangement, so that they may be moved about as the operator desires. A single centre pendant having a darkened inverted cone shade is placed in each ward to be used as a night light.

A property of dwelling houses alongside the Hospital was purchased by the Directors along with the site. This property stands immediately to the rear of the new buildings, and will be used as a Residency for students who will be within immediate call when their services are required. This new arrangement will prove very acceptable to students and young practitioners, who take out a course of instruction in the Hospital.

The total cost of the new buildings, including site, is about £80,000, and of that sum between £50,000 and £60,000 has already been raised.

Obituary.

CHARLES JAMES CULLINGWORTH, M.D., D.C.L., LL.D., F.R.C.P.,

Consulting Obstetric Physician to St. Thomas's Hospital, and Editor of this Journal.

The death of the distinguished man who, during the past two and a half years has been Editor of this Journal, calls forth feelings not merely of deep regret, but of almost irreparable loss. From its foundation Dr. Cullingworth took a keen interest in the Journal. From the first he was an active member of its Editorial Committee, and during the last few years of his life, at a time when most men would have wished to be free from work, and when his health was far from good, he devoted himself to the editorial duties with that wholeheartedness and earnestness which he gave to whatsoever work came to his hand. For editorial work, indeed, he had a rare talent, and many of our contributors must have seen for themselves how unsparing he was in his endeavours to maintain the Journal at the high standard he had set for it.

Dr. Cullingworth was a man of such wide interests and marked public spirit that it is not possible in the short time that has elapsed since his death for the pen of one of us to do proper justice to all the varied phases of his public and professional work. Accordingly, in this notice, nothing more will be given than a brief sketch of his life, and our next number will contain a fuller appreciation of his work by those best able to judge of it in its different aspects.

Charles James Cullingworth was born in Leeds on June 3rd, 1841. He was educated at the Wesley College, Sheffield, and with an idea of entering the legal profession matriculated at the University of London at the age of 17. Owing to his father's illness he had to abandon for a time all prospect of a professional career and to assist him in his business in Leeds. On his father's death a few years later, however, he sold the business and decided to take up the profession of medicine rather than that of the law. This he did by the old system of apprenticeship, at the same time entering as a student at the Leeds School of Medicine.

He began his medical studies in 1861, and obtained the medal and first prize in Anatomy and Physiology, in Surgery and in Medicine, the Surgeon's Clinical Prize and the Hardwick Prize in Clinical Medicine. He became M.R.C.S., Eng., in 1865 and L.S.A. in 1866, and afterwards spent a year and a half as assistant to a country practitioner at Bawtry, near Doncaster. On the suggestion of a friend, who had a high opinion of Cullingworth's abilities, he applied for and obtained a resident post at the Manchester Royal Infirmary, thus commencing a connection of nearly twenty years with the City of Manchester. After having charge of the medical and fever wards for two years, during which time he nearly lost his life from typhus fever contracted in the course of his duties, he began private practice in Manchester in 1869.

He was Police Surgeon to the C and D Divisions, and the experience of medico-legal work he thus obtained, resulted in his being appointed Lecturer in Medical Jurisprudence at Owens College, in 1878. During his tenure of this office he published several papers on medico-legal questions, of which the two best known are one on "Methods of Judicial Administration in the Past," and another on "The Criminal Responsibility of the Insane."

Though Dr. Cullingworth's first inclination was in the direction of general medicine, his interest in which is shown by several important papers he wrote on medical subjects, as for example one which is frequently quoted on a case of "Acute Yellow Atrophy," and one in the *Medical Times and Gazette* for August 3rd, 1878, on "Progressive Muscular Atrophy," he was guided towards gynæcology by his appointment, in 1873, as Surgeon to St. Mary's Hospital for Women. He became M.R.C.P. (Lond.), in 1879, took the degree of M.D., at the University of Durham in 1881, and gradually gave up general practice and devoted himself to gynæcology and obstetrics. In 1885 he was appointed to the chair of Obstetric Medicine at Owens College. In 1887 he was elected a Fellow of the Royal College of Physicians of London.

His work at St. Mary's Hospital was marked by a number of important papers on gynæcological subjects, especially on suppurative disease of the uterine appendages, but it may be noted that at this time Dr. Cullingworth's attention was not strictly confined to the surgery of the female pelvic organs, and that he recorded cases of operation on the kidney and bladder.

It is not possible to do more than indicate the manifold character of his work in Manchester. He served for five years as Honorary Secretary of the Board of Studies in the newly constituted Victoria University, but perhaps his greatest service to the profession in Manchester, and certainly the one to which he looked back with the

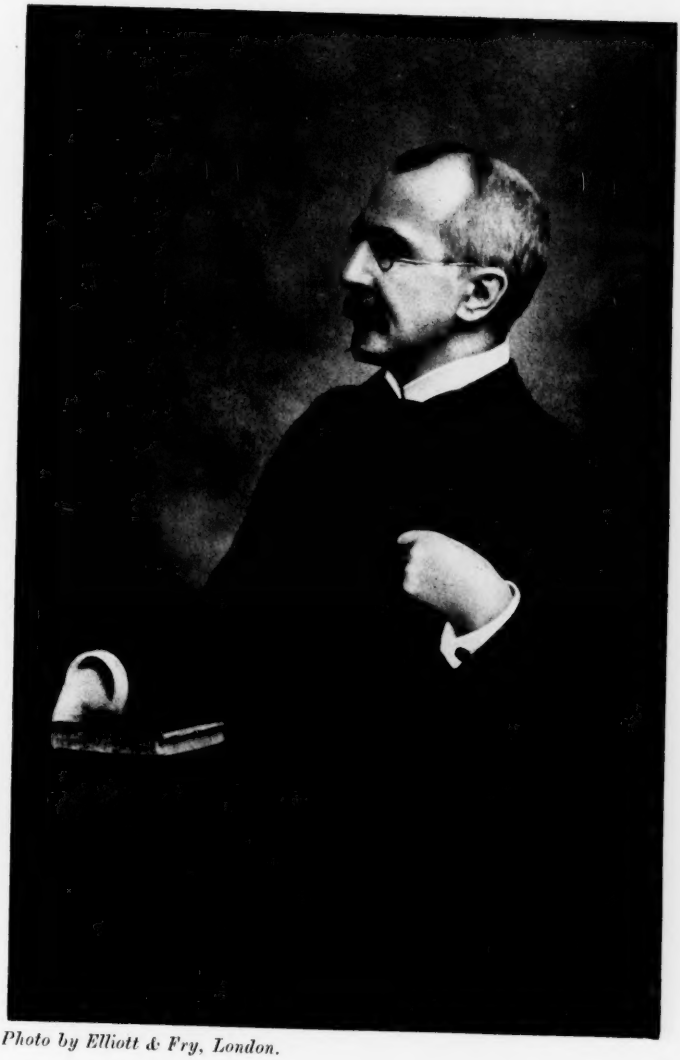


Photo by Elliott & Fry, London.

CHARLES JAMES CULLINGWORTH.

greatest pleasure and satisfaction to himself, was his nineteen years' connection with the Medical Society, in which for many years he held office as a member of the committee and as Hon. Secretary and Hon. Librarian. While librarian he issued several papers containing lists of books and pamphlets in the Society's possession, and one on the origin and growth of the library. His interest in medical literature was also shown by his preparing an alphabetical catalogue of the Radford Library at St. Mary's Hospital. This library contained some 3,500 volumes, but Dr. Cullingworth's industry in this self-imposed task cannot be gauged by the number of volumes, for many of these contained separate essays or pamphlets, all of which were catalogued. An extreme case was that of Heller's collection of medical disputations, which, though consisting of only seven volumes, contained 273 distinct dissertations.

In 1888 Dr. Cullingworth received an invitation from the staff of St. Thomas's Hospital to offer himself as a candidate for the post of Senior Obstetric Physician to the Hospital. Flattering as such an invitation must have been, its acceptance involved so much in the severance of associations and interests in Manchester, that it was only natural that he should feel considerable hesitation in coming to a decision. However, the attraction of work in London, and the wider sphere of activity opened out to him, determined him to apply for the vacant post and he was duly elected. His departure to London caused the most profound regret in Manchester, and he received many tokens of the esteem and regard in which he was held by his professional brethren there. His decision to leave an established practice and assured position in the northern city but illustrated the courage of the man, his confidence in his own power, and his love of his work.

In London he at once took an active part in the work of the Obstetrical Society, and was its President in 1898 and 1899. The paper he read in 1892 on "The value of abdominal section in certain cases of recurrent peritonitis, based on a personal experience of fifty cases," was one of the most important and far-reaching in the history of the Society. It gave rise to an interesting and protracted discussion, and marked its author as a pioneer of methods which are now so universally accepted that it is difficult to realize that fifteen years ago they were the subject of such keen debate.

The energy and thoroughness with which he threw himself into the work of all departments of the Hospital and School made it evident to his colleagues how much they gained by his co-operation. His surgical colleagues were the first to acknowledge the debt they owed to his pioneer work in pelvic surgery. By his boldness in discarding the isolation in a small ward and the

special pomp and ceremonial which since the days of Spencer Wells had surrounded ovariotomy, and in dispensing with drainage at a time when it was considered essential to success, he effected great changes in the practice of his hospital. As a clinical teacher he was successful in attracting the best type of student. He looked upon careful case recording as the best method of teaching, and insisted that every case, however trifling its nature, should be recorded with as much care as if it were to be reported in a journal or read before a society. He maintained that until the student had learnt by his own experience what could be omitted, it was essential that even the smallest detail should be noted; he was also extremely critical as to the style and composition of the clinical records, and many of his former clerks will readily acknowledge their indebtedness to him for valuable lessons in the writing of scientific papers as well as for instruction in the examination and observation of cases. Carelessness and slovenliness in clinical work always met with the severest censure, and one result of this was that the knowledge of what he expected from his clerks was sufficient to keep away from his ward those who were not prepared to fall in with his system. He had a clear incisive voice and an almost dramatic delivery, and in the lecture-room and by the bedside, he impressed the points he wished to make with an emphasis and lucidity that made his teaching most effective.

His knowledge of the conduct of business, and his experience of educational matters, were most helpful to his colleagues at St. Thomas's, and he at once obtained an unusual influence in the deliberations of the Staff Committees. In recognition of his valuable services the Staff and Governors of the Hospital extended his term of office as Obstetric Physician for a further period of three years after he had reached the age limit, and on his retirement from the active staff in 1904 he was made Consulting Obstetric Physician and Governor of the Hospital.

For some years Dr. Cullingworth was Visiting Physician to the General Lying-in Hospital, York Road, and always maintained a deep interest in its work.

Dr. Cullingworth was a man of decided opinions and great strength of character, entirely free from prejudice and self interest. The last thing he ever considered was how any measure would affect himself, the profession or the section of it he represented, and he regarded all public questions solely from the point of view of the community at large. The prevention of puerperal fever was to him a problem of the first magnitude, and on several occasions he gave public utterance to his views on the subject, notably in his inaugural address at St. Thomas's Hospital, in his presidential address at the Obstetrical Society, and in an address on the work of Oliver Wendell

Holmes. His enthusiasm for the subject was also shown by his active work on behalf of the State recognition of midwives.

Those who were privileged to know him intimately will always look back on their association with Cullingworth with affectionate regard. A striking and attractive personality, a strong sense of humour and wide interests made him a most delightful companion. His unfailing kindness and courtesy led to his assistance being asked by many who had little claim on him, but he rarely refused the sacrifice of time and trouble in order to give the benefit of his experience and sound judgement to comparative strangers. Many consulted him about their difficulties, and none left him without feeling better and stronger for his kindly help and sympathy.

He was a great reader, and his extensive knowledge of his country's classics and his faculty of assimilating what was best in them added charm to all he wrote.

His long and trying illness served but to bring out the courage and brightness of his nature. Some eight years ago he was seized with an anginal attack while at work in the hospital, and though the knowledge of all that it meant was evident to him, he lived and worked, so far as he could, as if it were not. Even during the last six months, when the attacks came with increasing severity and frequency, he was bright and cheerful, and maintained an undiminished interest in all that went on around him. Death came suddenly on May 11th, in one of these attacks.

He married a daughter of the late Richard Freeman, of London, who, with one daughter, survives him.

REVIEW OF CURRENT LITERATURE.

Adenocarcinoma Papillare et Gelatinosum of the Female Urethra.

R. PUPPEL, Koenigsberg (*Monats. f. Geburts. u. Gynäkol.*, Bd. xxvii, Ht. 1), describes the following unusual case: A woman of 45 years of age, had for a considerable time been aware of a pedicled tumour which depended from her genitals, and had steadily increased in size, though she had repeatedly scratched off parts of it. When examined she was found to have protruding from her vulva a tumour the size of a hen's egg with an uneven, cauliflower-like, greasy surface; of soft consistence, a brownish-red colour and bleeding easily. On further examination it was found that the tumour was attached by a broad base to the parts about the urethra and the anterior vaginal wall behind the symphysis, and was movable only to a very slight extent. It was removed by operation, and proved on microscopic examination to be an adenocarcinoma papillare et gelatinosum of the urethra. It was in direct connexion with the epithelium and glands of the urethra. Its malignity was evident from the multifarious division of the nuclei, from its remarkably thick epithelial investment, and from the proliferation of epithelial masses deep into the neighbouring tissues and their extension into the lymphatics. The deeper parts of the tumour showed mucoid degeneration of both parenchyma and stroma. As to its ætiology, Puppel supposes that at first a glandular papillary polyp with a long pedicle depended out of the urethra, and that under the constant and great irritation from clothes, from coitus, and from scratching and so forth, the originally papillary adenoma developed into an adenocarcinoma, which, from the root of the tumour, invaded the rest of the urethral mucosa, and that the mucosa, on its side, reacted to the irritation by polypous growth, so that ultimately the urethra came to lie in the midst of the tissue of the tumour.

Ciliary Action in the Female Genital System.

O. HOEHNE, Kiel (*Zentralb. f. Gynäkol.*, 1908, No. 5), in a preliminary communication, reports on the results of researches in 50 cases, to determine whether in the various phases through which the mucosa of the corpus uteri regularly passes (the interval, the pre-menstrual phase, the menstrual flow, and the post-menstrual phase) there is any variation in the functional activity of the cilia of the epithelium. In the human tubes during sexual life there is uninterrupted ciliary action, but the ciliated cells in the corpus uteri and in the cervix are not continuous over the whole surface but in patches. The superficial cells of the decidua in pregnancy have no cilia. Ciliated cells were found in the cervix in the fourth month in great activity, but as a rule the cervical mucosa in pregnancy is scantily furnished with cilia, and the absence of cilia seems to correspond with increased secretion by the cells. This he practically proved in animals.

MANDL, Vienna (*ibidem*, No. 13), who has examined 30 uteri, human and otherwise, has come to similar conclusions. He found that the uterine mucosa does not always show cilia in action, and that even when it does do so strips may be found the cells of which bear no cilia. In animals the ciliary action of the epithelium only goes on at certain times. Even in the tubes the ciliated epithelium is not continuous. At the times when the cilia of the epithelium are inactive, the cells show more secretory activity.

The Structure of the Uterine Mucosa during Sexual Life in relation to Menstruation.

HITSCHMANN and ADLER, Vienna (*Monats. f. Geburts. u. Gynäkol.*, Bd. xxvii, Ht. 1), from personal researches conclude that the uterine mucosa from the cessation of one menstrual hæmorrhage to the cessation of the next is constantly undergoing change. The cycle consists of different phases in each of which the condition of the mucosa is so characteristic that the periodic relation of the mucosa to menstruation may be determined from the microscopic appearances, frequently exactly to the day. The secretory activity of the uterine glands is characteristic of one definite phase, the so-called pre-menstrual, the glands then presenting the appearance hitherto attributed to endometritis glandularis. All the elements of the uterine mucosa share in these cyclical changes. The menstrual bleeding merely signifies the last phase of the periodic development of the mucosa, the involution of a condition nearly resembling the decidual mucosa and the commencement of a new cycle, while the pre-menstrual condition corresponds morphologically and functionally with the first stages in the formation of a decidua.

Dysmenorrhœa Membranacea.

HITSCHMANN and ADLER (*Monats. f. Geburts. u. Gynäkol.*, Bd. xxvii, Ht. 2) reject the connection of endometritis interstitialis with endometritis exfoliativa accepted by most authors. They assert that the menstrual and premenstrual mucous membrane exhibit a differentiation, dependent on menstruation, into two dissimilar portions, a superficial compact layer and a deep spongy layer, and that in this consists the preliminary condition for the detachment of the superficial layer, analogous to the detachment of the placenta, quite independent of the assistance of any inflammatory process. The separation of the two layers depends on the degree of their differentiation, and upon the activity of the contractions of the uterus elicited by obstruction to the discharge of the blood owing to actual or relative stenosis of the internal os. Dysmenorrhœa membranacea is therefore merely a form of menstruation in which the superficial layer of the mucosa is cast off in larger portions than those small fragments that are not infrequently shed. The curette does no good but for its palliative effect. Systematic premenstrual dilatation of the external os may be recommended.

The Beneficial Effect of the X-rays on Menstrual Troubles in 28 cases.

MANFRED FRAENKEL, Charlottenburg (*Zentralb. f. Gynäkol.*, 1908, No. 5), who reported last year (*ibidem*, 1907, No. 31) on his experiments on animals and on 3 cases in which menstrual troubles in women were relieved by radiation with X-rays, in this article describes the effects in 25 additional patients, including cases of menorrhagia, metrorrhagia, dysmenorrhœa, leucorrhœa and non-infective endometritis. All the cases were benefited, and this is the more remarkable as in many of them the treatment was not undertaken for affections gynecic in their nature, and was not directly applied to the abdominal regions. The cases included goitre, sciatica, psoriasis, eczema, enlarged axillary glands, also one of bronchial asthma with profuse climacteric hæmorrhage, and 4 cases of myomata in which the hæmorrhage was rapidly diminished though no absolute decrease in the size of the tumours could be ascertained. The improvement on the periods could not be in any way due to the psychical effect as many of the patients were not being treated for the gynæcological affection, and had no knowledge of the elective effect of the rays upon the ovaries, to which Fraenkel attributes their relief from menstrual trouble. Fraenkel recommends as the most favourable time for the treatment that immediately after a period, or at all events in the first half of the interval: two or three sittings in the second

half will ensure the effect of the earlier ones, and if the next succeeding period is beneficially altered two to four sittings in the next interval will prolong the improvement over the next catamenia. He interrupts the treatment after this two months' course, the improvement, however, has often extended over 3 or even 5 periods; eventually the menstruation resumes its former character. He strongly recommends the method as painless, free from danger and certainly beneficial. Occasionally it caused slight headaches and in one case nausea without vomiting, but that was all the accidental harm. The increased desire to micturate was remarkable and not easily explained. The urine examination was always negative, and the blood showed nothing abnormal. The articles of Foveau de Courmelles, Gorl and Deutsch are alluded to.

A Study in Comparative Anatomy in the changes which occur in the Fallopian Tubes during the Rut in Animals and during Menstruation in Women.

Ernst Holzbach, Tübingen (*Zeitschr. f. Geburts. und Gynäkol.*, Bd. lxi, Ht. 3).—Comparative anatomy teaches us that, in many of the lower animals, the tubes are not at all sharply differentiated from the uterus. In woman the conversion of Müller's ducts into tubes and uterus occurs at a comparatively late period of development. The fact that in the lower deciduata the tubes participate very considerably in the changes which the uterus undergoes during pregnancy and the rut, shows that the tubes and uterus have something in common in their function. Holzbach, in the present enquiry, seeks to show that the tubes, apart from being mere oviducts, have a special secreting function. He obtained evidence of this function by carefully examining the tubes at different periods of the rut in the same animal, and compared the changes found with those occurring in normal human tubes at different periods of menstruation in order to show that the human tube also possesses a secreting function.

Rats and rabbits were chosen for the research. During the rut these animals were anæsthetized, the tube of one side was excised and the abdomen then closed. Two or three weeks later, after the rut had passed off, the tube of the other side was excised and examined in the same way. In another series the tube of one side was excised before, and that of the other side during, the rut. The organs were fixed in Flemming's fluid; the chief stain used for the microscopic section was Heidenhain's iron-hæmatoxylin. In the quiescent period the tubes showed some evidence of a secreting function by the presence of goblet-cells in the epithelium and by variations in the level of the nuclei in the cells. During the rut there were marked changes; there was great hyperæmia and swelling of the whole mucous membrane of the tube and peculiar, narrow, threadlike cells were present between every second and third or third and fourth normal cell of the epithelium. These cells were of the same height as those of the normal epithelium, and stained very deeply. They consisted essentially of compressed nuclei and possessed hardly any protoplasm. This latter had escaped into the lumen of the tube as a secretion.

The human tubes examined at various stages of menstruation had been removed during the operation for the radical extirpation of the uterus, the operation, when possible, being performed at a definite phase in the menstrual cycle. During the period of pre-menstrual congestion the same threadlike cells were found in great numbers, and Holzbach advances this as evidence that human tubes possess a secreting function. He considers that in all deciduata at the periods during which the uterus is prepared for the reception of the ovum the whole tubo-uterine tract has a secreting function in which the tube takes an active part. The rut of animals must not be looked upon as corresponding to menstruation in women, but to the period of pre-menstrual congestion. The secretion of the tubes furnishes the earliest nourishment to the ovum.

Eardley Holland.

Arteriosclerosis of the Uterus.

R. B. Slocum (*Surgery, Gynæcology and Obstetrics*, April 1908) reports: A multipara, aged 57, had ceased to menstruate at 45, but a year later severe uterine hæmorrhage occurred and continued regularly for three years. During the next eight years there was no bleeding. A year before Slocum first saw her, the patient, whilst lifting a heavy load, was seized with severe pain in the right side. Acute appendicitis was diagnosed at that time, but shortly afterwards uterine hæmorrhage began, and increased in spite of ergot, curetting on three occasions, and local styptic applications. Slocum found her very anæmic, but there was no cardiac enlargement, and only such degree of general arterio-sclerosis as would be expected in a woman of her years. The urine contained a trace of albumen. There was a profuse bloody discharge from the uterus. The cervix was normal, the corpus uteri rather large, and there was a distinct mass in the right ovarian region. Slocum removed the whole uterus and the right ovary by the abdominal route; the ovary contained a blood-clot the size of a hen's egg; an opening in its capsule was closed by adherent omentum. The ovarian and uterine arteries were hard and brittle. A good recovery was made. The uterus measured 12 cm. in length; on section its arteries stood out as hard non-collapsible tubes. There was no infarct in it. Microscopically, the uterine mucosa showed no malignant changes. The musculosa was largely replaced by connective tissue. The arteries were patent, were much thickened, especially in their middle coats. Slocum quotes and gives references to several writers on such cases. He adopts Solowij's classification of them into (*a*) cases of so-called apoplexy of the uterus: (*b*) cases of external bleeding, occurring in women near the menopause. His own case belongs to the latter class, although the patient was twelve years past the menopause. Miles H. Phillips.

The Limits for Orthopædic and Surgical Treatment in Displacements of the Uterus.

Küstner, Breslau (*Münchener m. Wchnschr.*, 1908, No. 13, S. 695), speaking at the 29th Congress of the Balneological Society, opposed the idea that displacements, when mobile, should not be treated unless they gave trouble, since it is quite contrary to all the principles of prophylaxis not to deal with conditions that will certainly give trouble sooner or later. Anomalies in secretion are present in nearly every case, and demand most accurate observation. Pessaries are the best means of treating these cases, though occasionally after a pessary has been worn for some years an operation becomes necessary, and if so the Alexander-Adams is to be preferred to any other.

In cases of fixed displacement, the determination of its ætiology is of supreme importance, for the fixation is nearly always due to inflammatory adhesions consequent upon infection. The greater number of such infections are gonorrhœal, and they generally involve the adnexa while the pyogenous infections of childbed rarely do so. In connection with the choice of a method of treatment, various clinical forms have to be considered: (1) The adhesions may not be very firm, and may be released by massage: for such reposition of the uterus and massage is sufficient. (2) The adnexa may be swollen, if so orthopædic treatment is best omitted. (3) The adhesions may be so firm that the uterus seems more likely to give way than the adhesions; laparotomy is then indicated. (4) For recent cases cautious antiphlogistic measures only are adapted.

In Küstner's opinion the general prophylactic measures for fortifying the genitalia and preventing displacements fall under three heads: The clothing should be in accordance with the principles of the modern movement of reform; corporal exercises

and gymnastic practices should be far more generally adopted than heretofore; and the unnecessary excessively protracted supine position in which women have been kept after childbirth should be abandoned.

Rest in Bed after Labour.

MARTIN, Berlin (*Monats. f. Geburts. u. Gynäkol.*, Bd. xxvii, Ht. 2), after allowing 100 women to leave their beds for some hours during the days immediately after childbirth, concludes that the principles of conducting childbed proposed by Küstner may be recommended in cases in which infection can be excluded with the greatest certainty, and in which, while the patients remain under constant medical observation, they are not able to afford more than a short time for their recovery. Women in more comfortable circumstances, who are feeling well physically, may be allowed to change their position in bed very soon after delivery.

Inversion of the Uterus: Küstner's Operation.

W. E. SCHLEIER (*Zentralb. f. Gynäkol.*, 1908, No. 12, S. 408) reports two cases of inversion of the uterus in primiparæ, in one of whom forcible traction had been applied to the cord, while in the other the expulsion of the placenta as well as that of the child had been quite spontaneous and normal. The one was operated upon three and a half, the other one and a half months after labour. In the latter manual reposition under anæsthesia was attempted before operation unsuccessfully and with a tear in the anterior lip of the os uteri as its result. Both cases were dealt with by Küstner's operation and recovered without fever or any interruption. Schleier declares Küstner's operation to be the only rational and safe way of treating inversion. He points out, however, that in each of these cases reposition was only possible after the whole of the posterior wall of the uterus had been divided, and recommends that no attempt should be made to repose the uterus with an incomplete division of that wall.

A Case of Combination of Carcinoma, diffuse Adenoma, and Tuberculosis in the same Uterus.

A. SCHÜTZE, Königsberg (*Zeitschr. f. Geburts. u. Gynäkol.*, Bd. lx, Ht. 3), describes the following case:—A married nullipara, 40 years of age, had suffered for five years from profuse menorrhagia, and as treatment by curetting and drugs was of no avail, the uterus was ultimately removed by vaginal hysterectomy. Examination of the specimen revealed the following condition: The cervix was the seat of adenocarcinoma. The mucous membrane of the uterus was healthy, but the myometrium was the seat of diffuse adenoma distributed unequally throughout the whole organ and most marked towards the fundus. In the connective-tissue of this adenoma, and, to a lesser extent, in that of the rest of the wall of the uterus, many tubercles, with typical giant-cells, were present, but no tubercle bacilli were found. Psammoma bodies were also scattered freely throughout the wall of the whole uterus.

The combination of carcinoma and tuberculosis in the same uterus is rare, and still more rare is the combination of carcinoma and tuberculosis in a diffuse adenoma. Schütze discusses the case at some length, and gives an account of the literature of other reported cases. EARDLEY HOLLAND.

The Frequency of Malignant Ovarian Tumours.

RAVANO (*Gynæcologische Rundschau*, 1908, Ht. 7) gives a review of all the ovarian tumours treated in Leopold's Klinik in Dresden, during twenty years (1887—1907). During this period 699 cases of ovarian and parovarian tumours were operated upon. They are divided into two groups—simple and malignant.

The *simple tumours* numbered 338, or 48 per cent. of all ovarian tumours. They affected the left ovary in 149 cases, the right ovary in 151, and were bilateral in 38.

The age of the patients was between 10—20 years, in 11 cases 3·25 per cent.

,,	,,	,,	,,	20—30	,,	,, 112	,,	33·14	,,
,,	,,	,,	,,	30—40	,,	,, 93	,,	27·53	,,
,,	,,	,,	,,	40—50	,,	,, 65	,,	19·23	,,
,,	,,	,,	,,	50—60	,,	,, 43	,,	12·72	,,
,,	,,	,,	,,	60—70	,,	,, 13	,,	3·85	,,
,,	,,	,,	,,	70—80	,,	,, 1	,,	0·27	,,

Dermoid cysts were present in 66 cases, affecting the right ovary in 33, the left in 24, and both ovaries in 9 cases. Of these 40 per cent. occurred between the ages of 30—40.

Parovarian cysts, 31 on the left side and 24 on the right, occurred in 7·86 per cent. of cases, frequently between the ages of 20—30. The total number of simple ovarian and parovarian tumours was 67 per cent.

The *malignant tumours*. Of these 14 per cent. were malignant degenerations of cystomata, occurring most frequently between the ages of 40—50. *Carcinoma* occurred in 12·3 per cent. of cases, most frequently between the same ages. *Sarcoma* occurred in 4 per cent. of cases, affecting both ovaries in half the cases. *Syncytioma* was only seen in 1 case. Altogether malignant tumours formed 32·8 per cent. of all the cases. Of these 53 per cent. were bilateral, while in the benign forms only 10 per cent. were bilateral. Tables are appended which bring out the following points:—(1) Ovarian tumours occurring between 40—60 are in half the cases malignant; (2) ovarian tumours in childhood up to 15 years are almost always sarcomata or sarcomatous degeneration of a cyst; (3) in case of a malignant tumour of an ovary it is advisable to remove the other ovary also. E. Scott Carmichael.

Bilateral Hydrosalpinx with Patent Fallopian Tubes, associated with Pseudo-Myxoma Peritonei.

Sitzenfrey (*Gynæcologische Rundschau*, 1908, Ht. 9).—Most authors agree with Martin that, pathologically, hydrosalpinx is associated with occlusion of the abdominal end of the tube. Froriep, however, describes two forms, one being the so-called "Hydrops tubæ Fallopii apertæ." The patient in the case Sitzenfrey describes was 36 years of age, complaining of swelling abdomen. On laparotomy, the abdominal cavity was found full of gelatinous material, the right ovary having developed into a cystic tumour as large as a child's head. Both Fallopian tubes were likewise distended to the uterine end with gelatinous material; the abdominal ends of the tubes were not closed, but filled up with this gelatinous material.

E. Scott Carmichael.

Extra-Uterine Pregnancy at Term with Living Child.

Potocki (*Comptes Rend. Soc. d'Obst. de Gyn. de Paris*, January 1908) reports a case with the following history: A nullipara, aged 23, at the full term of pregnancy was sent into hospital by a midwife who had noticed some irregularity of the abdomen. The pregnancy had been normal until the end of the fourth month when the patient complained of severe pain in the abdomen with faintness, followed by diarrhœa and vomiting, and the doctor in attendance treated her for threatened abortion with peritonitis. The symptoms abated, but returned a few weeks later, and the patient remained at rest until the end of the pregnancy. Fœtal movements were felt from the 4½ month. At no time was there any hæmorrhage from the vagina. On examination the abdomen was found to be distended irregularly; in the hypogastric region a prominent boggy mass was felt limited above by a distinct margin three fingers' breadth below the umbilicus, and

over this area the placental souffle was heard. Up to four fingers' breadth above the umbilicus was a fluctuant area over which the fœtal movements could be seen; above it the body of the fœtus could be felt back upwards, the head being in the left and the breech in the right side of the mother's pelvis. The fœtal heart sounds were best heard in the middle line above the umbilicus. In the hypogastric region, to the right of the middle line, there was a prominence, regular in outline and firm in consistence, and separated from the placental mass by a sharp line; this mass was taken to be the body of the uterus. On vaginal examination an irregular mass was found filling the posterior and left fornices. The diagnosis of extra-uterine pregnancy was made and immediate laparotomy decided upon, it being the intention to extract the fœtus by Pinard's method, suture the sac to the abdominal wall, and allow the placenta to separate by itself. On opening the abdomen the amniotic sac was easily set free and the placental mass seen below it. The sac was opened and the amniotic fluid escaped, the fœtus was extracted, the cord was cut as far away from the placenta as possible, and the child cried loudly. The wall of the fœtal sac consisted of amnion alone, and was so thin that it was impossible to suture it to the abdominal wall. On gently raising the lower border of the placenta some alarming hæmorrhage occurred, but this was controlled by clamping the infundibulo-pelvic and broad ligaments close to the uterus, thus occluding the right uterine and utero-ovarian arteries. The placenta was enucleated almost spontaneously out of the abdominal wound and was removed. The tumour mass was brought up, and after its pedicle had been ligatured, was removed. The uterus and left appendages, appearing normal, were left in place. The abdominal wound was drained, the drainage being gradually removed, and the last tube finally taken out on the fifteenth day. The patient made an excellent recovery, and left hospital a month later.

The child was healthy and well formed, the only peculiarity being a somewhat microcephalic condition with some ossification of the bones of the cranium. It did well up till the sixth month, when it became subject to convulsive attacks of an epileptiform character, and at the age of two years its condition bordered on idiocy.

Potocki gives a detailed description with illustrations of the specimens removed. The fœtal sac is made up of amnion alone, the cord inserted laterally where the thin wall of the sac is joined to the placenta. The right ovary is normal; the abdominal end of the Fallopian tube is normal also, but the middle portion is thickened and adherent to the sac wall; further on the uterine end is found to become smaller at its uterine insertion. The ovum has been developed undoubtedly at the isthmus of the tube. A vertical section through the specimen shows the large placenta projecting into the cavity of the sac, the membranes inserted below and the whole fœtal tubal sac wall ruptured with the exception of the amnion, which persisted alone. The placenta was turned completely inside out.

Potocki comments on the facts that the patient had never borne any children previously, that there was no hæmorrhage at any time during the gestation period, and that, up to the fourth month, no abnormal symptoms were observed. The subsequent attacks of pain cannot have been very severe as the patient had not to take to her bed for any length of time; she had the appearance of a healthy pregnant woman. That the pregnancy went to full term, but that the risks of accidents were great, was proved by the hæmorrhage which took place on touching the placental surface at the operation. It is therefore necessary in cases such as this one that the patient keep absolutely quiet in bed during the later months of gestation.

The abdominal examination revealed the surface irregularities, and the diagnosis of the position of the fœtus and placenta was confirmed on opening into the abdominal cavity. The size of the abdomen corresponded to that of a full term pregnancy, and the time for operation was the correct one, the child being alive and

viable. Suturing of the sac to the abdominal opening was impossible owing to the wall being so thin. The conservative practice of leaving the opposite tube and ovary intact was justified by the patient becoming pregnant again two years later.

The child was well-developed, but showed signs of microcephalus, although pressure on the head was impossible in this case.

It is of interest to note the site of the placenta in the isthmus of the tube, as the general idea is that when it is in this situation the gestation is liable to early rupture, The fœtal sac was similar in form to that of a tubal pregnancy in the early months; this explains the facility with which it was removed at operation.

A. Louise McIlroy.

On the Relation of the Interstitial Glands of the Ovary to Osteomalacia.

J. Wallart, Basle (*Zeitschr. f. Geburts. u. Gynäkol.*, Bd. lxi, Ht. 3).—Since Fehling first demonstrated that removal of the ovaries cured or arrested many cases of osteo-malacia, much work has been done to discover the nature of the relationship between the ovaries and this disease. Yet, so far, no constant definite change has been found, and different observers have described hyaline degeneration of the blood-vessels, hyperæmia, looseness of the ovarian connective-tissue, decrease in the number of primordial follicles, and, in some cases, no change at all from the normal. Wallart argues that the relationship of the ovaries to osteo-malacia must depend upon an internal secretion, and that therefore it is in those elements of the ovary which possess a secretory function that changes should be sought for. The secreting elements of the ovary are: (1) the corpus luteum; (2) the interstitial glands of the ovary. These latter are groups of cells containing fat-like granules which arise from the theca interna of follicles undergoing retrogressive changes,—and are of comparatively recent development in ovarian histology; different observers have also termed them corpora lutea atretica or spuria. (3) Decidua-like cells which are found in the ovary in varying numbers in pregnancy, apparently in inverse proportion to the number of interstitial glands. It is, of course, a pure hypothesis to place these cells amongst the secreting elements of the ovary.

Wallart has examined five cases of osteo-malacia, with special reference to the condition of the interstitial glands of the ovary:—

Case I. Decipara; artificial induction of labour; double oöphorectomy. Slight increase in the number of interstitial glands found.

Case II. Quartipara; Cæsarean section; double oöphorectomy. Both decidua-like cells and interstitial glands slightly increased in number.

Case III. Octipara; death from rupture of the uterus; interstitial glands present, but not in excessive numbers.

Case IV. Quartipara; normal labour; double oöphorectomy. An enormous number of decidua-like cells found throughout the cortex of the ovary; very few interstitial glands found.

Case V. Had never been pregnant; death from renal disease. The left ovary contained one large corpus luteum and two smaller ones; there were numbers of collections of dark-yellow pigment scattered throughout the ovary. The right ovary contained three corpora lutea and similar collections of pigment. Microscopically, the cells of the corpora lutea appeared to be in a state of degeneration; the smaller collections of pigment had all the appearances of interstitial glands. The presence of so many corpora lutea in equal stages of development was an unusual feature.

To sum up, there was an increase in the number of interstitial glands in all the cases except the fourth, in which there was an enormous increase in the decidua-like cells.

Wallart thinks, therefore, that a connection between osteo-malacia and increased

secretory activity of the secreting elements of the ovary is possible, but that further work will be necessary to really prove it.

In every case of pregnancy changes take place in the bones, especially in the pelvis, the changes disappearing after the termination of pregnancy; and, on the hypothesis that osteo-malacia is an excess of this normal process, and that the process is due to vaso-dilatation, Bossi has used adrenalin in the treatment of the disease, and with some success. The cause of the process has yet to be determined.

EARDLEY HOLLAND.

The Treatment of Eclampsia.

OSTERLOH, Dresden (*Münchener m. Wchnschr.*, 1908, No. 11, S. 553), after reviewing the various methods of treating eclampsia that have been in vogue during the last 35 years, gives the results obtained in the 61 cases admitted to Dresden-Friedrichstadt Municipal Hospital since its opening on May 1, 1898, and gives the following details of his own method of treatment.

In cases of threatening eclampsia during pregnancy, that is to say if in spite of treatment the albumen in the urine increases, microscopic examination shows severe renal disease, and the amount of urine excreted daily persistently and rapidly diminishes, the pregnancy is interrupted. The cervix is dilated with Bossi's instrument or laminaria, until a rubber bag can be introduced (colpeurynter, Tarnier's balloon, or a Barnes-Fehling metreurynter) followed by the induction and termination of labour on general principles.

If eclampsia actually occurs while the cervix persists and the os uteri is undilated, Bossi's instrument may be used to obtain dilatation enough to allow delivery. Cervical incisions, however, have been employed successfully with the same object. Whenever less severe methods are justifiable, for example when the fits are neither violent or frequent and consciousness returns in the intervals, metreurysis is employed; in some instances the child is born spontaneously immediately after the expulsion of the bag.

It need hardly be said that when at the onset of the eclamptic convulsions the genital canal is already sufficiently dilated to allow it, the woman is delivered at once. Under this treatment 4 out of 5 sick pregnant women, and 7 out of 8 women in labour recovered.

But the treatment of eclampsia also included venesection to from 200 to 600 ccm. when the pulse was full and hard, cyanosis marked and œdema of the lungs beginning; also repeated subcutaneous injections of physiological salt solution to the amount of 1,000 or 1,500 ccm.; morphia hypodermically, combined in 7 cases with scopolamine; hydrate of chloral in clysters; ether and camphor subcutaneously for symptoms of collapse, followed by caffeine (the sodio-salycilate) to promote diuresis, and radiation with electric glow lamps to induce diaphoresis. Of the 7 cases in which scopolamine and morphia were used, 2 died, both of whom fell ill at home; the first during an abortion at the beginning of the fourth month and after 69 fits in 18 hours; the second had 24 fits after spontaneous delivery and collapsed. In the 5 cases that got well the combination seemed to have a tranquilizing effect.

OSTERLOH intends to test Stroganoff's method of administering oxygen during the convulsions and, as recommended by Bumm and his pupils Liepmann and Strempel, clearing the mouth and nose of mucus, artificial respiration, cold slapping and rubbing especially of the cardiac region, and massage of the heart. These measures he deems worthy of special attention in the presence of symptoms of collapse.

Renal Decapsulation in Puerperal Eclampsia.

BAUMM (*Zentralb. f. Gynäkol.*, 1908, No. 12, S. 403) reported to the Gynæcological Society of Breslau the case of a tertipara, 34 years of age, who, after a normal confinement, was attacked by eclampsia. After ten fits her temperature was 39·5°C.,

her pulse 156 and remittent, and her respiration spasmodic, gasping and stertorous. As she was no better the next day she was operated on, the left kidney was decapsuled but the right could not be found. She immediately improved and regained complete consciousness, but on the fourth day her mental condition became affected, she became maniacal and greatly excited; her pulse rose to 160; she rapidly sank and expired on the fifth day of childbed. The autopsy disclosed the cause of death to be internal hæmorrhage from two gastric ulcers, and also confirmed the absence of the right kidney.

Falgowski described a case that had been under the care of Professor Asch (*ante*, p. 222), and advocated timely operation before the function of the kidneys had entirely ceased, that is before their epithelial system had suffered excessively, for once extensive necrosis has occurred the relief of pressure afforded by decapsulation can be of no help.

Asch said that when eclampsia occurred before delivery decapsulation might be deferred till it appeared that the customary beneficial effect of emptying the uterus failed to bring adequate improvement. For the severe cases coming on after delivery, such as that reported by Falgowski, they had hardly any resource but decapsulation, the results of which had exceeded all their expectations. The acute swelling of the kidneys left them incarcerated in their capsules—entirely incapable of functionating. If toxic matter was the cause of the primary swelling of the kidneys, the extinction of their function led to retention of the poison. This vicious circle was ruptured by the decapsulation and the liberation of the kidneys, so that recovery was then possible.

Renal Decapsulation in Eclampsia.

Wiener, Aix (*Monats. f. Geb. u. Gyn.*, Bd. xxvii, Ht. 3), reports a brilliantly successful case of decapsulation of the kidneys in severe puerperal eclampsia after all regular symptomatic treatment had been tried in vain. The convulsions ceased immediately after the operation. He describes two other cases dealt with in the same way; one succumbed owing to infection of the operation wound, the other recovered, though there were some convulsions after the operation. Wiener considers decapsulation of the kidneys to be indicated whenever, after delivery, the eclampsia shows no improvement.

E. Essen-Müller, Lund (*Zentralb. f. Gyn.*, 1908, No. 14), reports:—A quintipara of 36 years of age, with albuminuria, was, owing to eclamptic convulsions, near the termination of her pregnancy, delivered by vaginal Cæsarean section, and the child lived. As after the operation she was comatose and had further convulsive attacks, he performed decapsulation of both kidneys, but the woman died soon afterwards. The kidneys were little, if at all, enlarged, and there was no remarkable tension of the parenchyma or capsule. In this instance decapsulation did not appear to have any good effect.

The Suprarenal Capsules in Eclampsia and the Nephritis of Pregnancy.

Chirié, Paris (*L'Obstétrique*, April, 1908), gives a study of 28 cases in which the suprarenals were examined; he found that in eclampsia, retro-placental hæmorrhage and in the nephritis of pregnancy, hyperplasia of the cortex is found almost constantly, and hyperplasia of the medulla very commonly. This condition of the cortex is probably related to the antitoxic and angiotonic functions of the gland. The hyperplasia of the medulla appears before the cardiac hypertrophy. The changes in the suprarenals are secondary to the lesions in the kidneys. E. H. L. G.

Intraabdominal Hæmorrhage in the Eighth Month of Intrauterine Pregnancy.

PRAEGER, Chemnitz (*Münchener m. Wchnschr.*, 1908, No. 14, S. 765), says: A woman, aged 37, who had had four children without obstetric help, was brought into hospital complaining of intense pain all over her abdomen, and extremely pale with a feeble intermitting pulse. A diagnosis was made of pregnancy in the eighth month, with intra-abdominal bleeding from unascertained cause. Abdominal section was performed, and a large quantity of fluid and clotted blood was found in the cavity. Examination of the uterus, adnexa, stomach, intestines, spleen, liver and renal regions disclosed nothing. The parts about the round and broad ligaments down to the floor of the pelvis were suffused with blood, and on the posterior surface of the broad ligament, close to the right border of the uterus, there was a bleeding spot partially covered by a small clot. When the clot had been wiped away, there was free hæmorrhage from a dilated vein; several transfixion sutures with catgut failed to arrest the bleeding, as new branches of the vessel were pierced each time. On account of the desperate condition of the patient a Miculicz tampon was applied to the bleeding part and the abdominal wound was closed, in layers, except the spot for drainage. During the operation 2,000 cm. of salt solution were given subcutaneously. Next morning, before uterine contractions had begun, the membranes were visible, and after they had been ruptured delivery of a girl 39 cm. long and some time dead was easily and rapidly accomplished. The Miculicz tampon was removed, and the wound completely closed. After some trouble for a day and a half (vomiting and meteorismus) a clyster was followed by fæces and flatus, and the woman did well.

Praeger, commenting on this case, pointed out that while dangerous, and frequently fatal, hæmorrhage from the rupture, during pregnancy, of varices in the vagina or labia majora, have been described by various authors (v. *ante*, p. 221), he has not been able to find any record of the rupture of a varix in the abdomen, though somewhat similar fatalities have been described by Sertugin, probably, but not certainly, from rupture of a vessel in the mesocolon, and by Holowko, from rupture of adhesions between the transverse and ascending colon. In the differential diagnosis of cases of the kind, consideration must be given to: subperitoneal hæmatomata of the abdominal walls, lacerations of the spleen or liver, injuries or rupture of the stomach or intestines, rupture of the pregnant uterus, intra-abdominal hæmorrhage due to myomata or to adnexal disease, especially to torsion of a pedicle, interruption of ectopic coincident with intra-uterine pregnancy, rupture of a pyosalpinx, or appendicitis in pregnancy. Moreover, the differential diagnosis between pulmonary embolism and intra-abdominal hæmorrhage during pregnancy, may be difficult. v. Herff records a laparotomy vainly performed for tubal rupture in a case which section proved to be one of pulmonary embolism, and Praeger here relates a case taken to be pulmonary embolism but which was probably one of intra-abdominal hæmorrhage; unfortunately it was fatal before operation could be performed, and section was not permitted.

Repeated Pregnancy and Labour in a Uterus Arcuatus.

BUECHELER (*Münchener m. Wchnschr.*, 1908, No. 13, S. 698) reports: In the first pregnancy of a well-built, healthy woman, 26 years of age, the child presented in the first dorso-inferior transverse position on account of the arcuate shape of the uterus, which resembled the heart of a playing card. External version was tried in vain three weeks before labour. The membranes broke prematurely, and on the third day of labour, after attempts with colpeurynter and metreurynter, the cervix was finally dilated with a Champetier de Ribes bag, 32 cm. in circumference. Version was then easily performed, but there was such rigidity of the cervical segment, that though the heart sounds of the child were strong and regular long after the version

and the uterine contractions were of moderate force and not spasmodic, it died after the breech entered the os uteri. Under renewed narcosis the child was extracted, but the head was held fast in the canal and had to be perforated. The placenta was expressed by Credé's method owing to hæmorrhage in the third stage. The involution of the uterus was complete, and after six weeks the organ was apparently normal.

The woman conceived again within six months, and the position of the child in the womb was the same as in the first pregnancy; it was with some difficulty changed into the second transverse position, and then into the first head presentation, by external version. Ten days later the head spontaneously assumed the second position and entered the pelvic brim, and, after an easy labour, a living boy was born, 51 cm. long and 3,180 grammes in weight. [According to the date of the last menstruation the labour was a month before term, but the child seems to have been fully developed.]

Breech Presentations.

De Normandie (*Surgery, Gynæcology and Obstetrics*, 1908, April) analyses 250 cases delivered, in the course of ten years, in the Boston Lying-in Hospital. Multiple pregnancies, premature and macerated fœtuses are not included. Of the 250, 57 per cent. occurred in primiparæ; 132 engaged in the right (English nomenclature) oblique diameter, 106 in the left, in 12 there was no record of the presentation. There were 27 (nearly 11 per cent.) fœtal deaths directly due to the presentation, but in 21 cases in which the membranes ruptured prematurely, 12 (over 60 per cent.) children were still-born. Hence De Normandie argues that early rupture of the membranes, without advance in labour, is an indication for immediate operative interference. Prolapse of the cord demands immediate extraction. On the other hand, long labour is not in itself an indication for operative treatment.

Miles H. Phillips.

Rupture of Uterus, with Prolapse of Small Intestine.

H. J. Donaldson (*Surgery, Gynæcology and Obstetrics*, 1908, April) was called to a woman twelve hours after forceps delivery. During the expulsion of the placenta an enormous mass of intestine had prolapsed through the vagina, and Donaldson found her in profound shock with a pulse-rate of 160. The perineum was torn to the rectum. The coil of intestine, which was stripped from its mesentery, was tightly gripped by the contracted cervix. He opened the abdomen, resected the 126 inches of the prolapsed small bowel and performed a lateral anastomosis. A T-shaped rupture of the posterior wall of the uterus extended from the fundus to the cervix, and thence half-way round the cervix; it was sutured, but it was impossible to close the circular tear properly. The pelvis was drained by gauze passing through the cervical wound into the vagina, and the abdominal wound was closed completely. The perineum was then sutured. The patient did very well for seven days, food being retained, and the bowels acting naturally. On the eighth day symptoms of sepsis commenced with a rigor and a foul vaginal discharge, and she died on the tenth day from septic metritis. Donaldson believes that had he been able to remove the uterus the patient would have recovered.

Miles H. Phillips.

Acute Prolapse of the Posterior Vaginal Wall in a Primipara.

Engländer (*Gynæcologische Rundschau*, 1908, Heft 3).—The patient, aged 20, was pregnant for the first time. The size of the uterus corresponded to the sixth month of pregnancy. A vaginal tumour, about the size of a hen's egg, was present, projecting beyond the vulva, with a broad pedicle attached to the posterior vaginal

wall, in the position of the columna rugarum posterior. It was not connected with the rectum or cervix uteri. It was associated with a serous bloody discharge. The differential diagnosis lay between vaginal varix, solid vaginal tumour, tumour of rectum, a rectocele or hernia through the posterior vaginal wall, or a hernia of the vaginal wall detached from the rectum. Careful rectal and vaginal examination proved the last to be the actual condition. E. SCOTT CARMICHAEL.

Cystic Lymphangioma of the Fœtal Thorax impeding delivery.

HEIL (*Gynæcologische Rundschau*, 1908, Heft 9) reports a case of head presentation in which the trunk, owing to its large size, could not be extracted without decapitation followed by turning. The tumour was situated on the left side of the fœtal thorax. A few similar cases have been recorded. One was reported by Eberhardt in which decapitation was also carried out, but the delivery of the trunk could not be effected till perforation of the cystic tumour had been performed.

E. SCOTT CARMICHAEL.

Injuries to Children due to Version.

PFORTE (*Gynæcologische Rundschau*, 1908, Heft 8).—In two cases a fracture of both bones of the forearm occurred. In these cases turning had been performed on account of eclampsia and contracted pelvis. In a third case there was separation of the upper epiphysis of the femur. Two factors seemed to account for the injury. These were strong traction and rotation about the long axis of the limb. Turning had been performed in this case also. E. SCOTT CARMICHAEL.

Endoscopic Examination of the Uterus after Abortion, and during the Puerperium.

CH. DAVID (*Bulletin de la Société d'Obstétrique de Paris*. December, 1907) describes an endoscope modified by himself, consisting of an outer tube fitted with a carrier to facilitate its introduction, and an inner tube having a mirror at the end illuminated by an electric lamp.

Examination after a normal confinement showed the uterine mucosa to be smooth and of a uniform pink colour except at the placental site where it was rough and had many blackish-red coagula adherent.

By means of this instrument David was able to discover pieces of retained placenta which had escaped detection when the uterine cavity was explored with the finger.

In puerperal fever areas of ulceration and gangrenous patches were seen: in puerperal endometritis the mucosa was rugose and of a greyish-white colour.

The recent occurrence of abortion was obvious, and in a case of criminal abortion a penetrating wound of the uterine wall was demonstrated, and David was able to diagnose a double uterus with a septic ovum in one of its cavities.

A. LIONEL SMITH.

Use of Collargol in Puerperal Sepsis.

BONNAIRE and JEANNIN, Paris (*L'Obstétrique*, April, 1908), give their experience of the treatment of 49 cases of puerperal sepsis in the isolation wards of the Lariboisière Maternity. After describing the chemistry and pharmacy of colloid silver, they give details and charts of their cases, and conclude that collargol may be used prophylactically after labours which have been much delayed in the second stage or where there are doubts about the asepsis of the treatment. It is of most use as a curative agent. It may be combined with other treatment, such as curetting, douching, fixation abscess and so on. The only way to obtain the full action of the drug is by intravenous injection (10 to 15 cc. of 1 per cent. solution)

every 48 hours: as the action is somewhat transient the effect may be kept up by intra-muscular injections two or three times a day in the intervals. The intravenous injection is best made directly into the vein without cutting down on it: if a needle be used with a short bevel at the point there is less risk of passing it right through the vein. The injection is often followed by a temporary rise of temperature to 105·5° or more. E. H. L. O.

Decalcification of Pregnancy continued after Delivery.

Marquis, Rennes (*L'Obstétrique*, April, 1908), reports the analyses made in a case in which, contrary to the usual course, decalcification continued after delivery. Most of the work hitherto done in this direction has been in cases of true osteomalacia. This patient, a primipara, aged 27, was admitted to hospital in the eighth month of pregnancy complaining of increasing pains in the limbs and back, which had begun early in pregnancy and now prevented her from walking. The pelvic outlet was narrow and there were evidences of rickets. Her condition did not get worse, but was not improved by a diet rich in lime salts. Two and a half months after delivery her general condition was as before; there was tenderness over the pelvic bones, but no osteophytes could be felt. The pubic bones moved at the symphysis. At this time her diet contained 0·425 grams of lime, and she excreted 1·2 gram. Her blood, before delivery, contained 0·012 per cent. of lime, and, after it, 0·015 per cent. of lime, instead of the normal 0·0052. Marquis throws no light on the pathology of the condition. E. H. L. O.

Death of the Mature Fœtus in Labour.

H. M. Stowe (*Surgery, Gynæcology and Obstetrics*, April 1908), gives a tabulated report of the clinical details of 190 such deaths which occurred in hospital or in his private practice. To this he adds a brief summary of the post-mortem findings in 33 of the cases. In discussing the pathology of intra-partum fœtal death he recognizes two types of case: (1) the asphyctic, in which interference with the placental circulation has led to premature stimulation of the respiratory centre; (2) the apnœic, in which the respiratory centre is paralyzed by injuries due to the mechanism of labour or to operative measures. He describes in detail the various stages and the final state of both types of case. The various complications of labour which may lead to intra-partum death are discussed at length in the light of his own cases.

Stowe strongly advocates measures to facilitate the early detection of danger signals: (1) Careful antepartum examination of the mother for complications such as pelvic deformity; (2) frequent auscultation of the fœtal heart during complicated labours. Danger of asphyxia is denoted by a heart rate below 100, or above 160, per minute, during the intervals between uterine contractions. Increased fœtal movements and the passage of meconium are much less valuable signs. Miles H. Phillips.

Bronchiectasis in the Fœtus.

Michel de Kervily, Paris (*L'Obstétrique*, April, 1908), describes this condition of the lung found by himself in three cases and by Dr. Thomas in a fourth. The part of the lung affected is enlarged to 8 or 10 times its volume when unexpanded; it is hard, inelastic, and sinks in water. Numerous drawings illustrate the microscopic appearance. In the first of the series the lesions found were enormous dilatation of the bronchioles and vesicles along with adenomatous tumours formed of irregular tubules lined with cubical epithelium, with central nuclei, lying in connective-tissue in which air vesicles have not been formed. In the second case the adenomatous tumours had the tubules lined with a single layer of cylindrical mucous cells with basal nuclei. This is the condition described by Couvelaire as

congenital degeneration of the lung. The third fœtus had three lobes in its left lung, and these were further fissured. The bronchioles were dilated, the vesicles also right out to the pleura. The cavities were lined with cylindrical epithelium, ciliated in parts; throughout, even in the parts not bronchiectatic, there was evidence of broncho-pneumonia. Treponemes (spirochetes) were not found in any of these cases, though looked for in many hundreds of sections, but the fourth case was certainly syphilitic. The dilatation of the bronchioles in a developing lung is an inflammatory reaction set up by some poison such as syphilis. E. H. L. O.

Retro-Uterine Sensory Corpuscles in the Human Fœtus.

KEIFFER, Brussels (*L'Obstétrique*, April, 1908), in working at the nerves of the uterus, found in six months' fœtuses bodies resembling Pacini corpuscles. He made serial sections in a plane parallel to the front wall of the rectum, and in the region of Frankenhaüser's cervical ganglion, discovered by Ramon y Cajal's stain the bodies which he describes. These have one or three axis-cylinders, and are single or in clumps of three. They differ from the Pacini corpuscles in having a cellular sheath round the axis-cylinder, but this may be transitory. They are situate on the mixed sympathetic and spinal nerves proceeding directly to the uterus, and are of interest in connexion with the sensory innervation of the uterus which is almost unknown; in connexion with the Keilmann-Knüpffer hypothesis of the cause of the onset of labour; in connexion with the pains of the artificial or natural dilatation of the cervix and with the physiology of coïtus. Keiffer has not found these corpuscles in the smaller mammalians. The article is illustrated. E. H. L. O.

A Case of Co-existence of a uterus, of two Tubes and two Testicles in the Tunica Vaginalis.

CORNIL and BROSSARD (*Revue de Gynécologie et de Chirurgie Abdominale*, 1908, March-April).—Teratomata have been occasionally found in the tunica vaginalis, but no case so curious as the following as ever been described :—

The patient was a man of effeminate aspect, age 26, who from birth had suffered from a scrotal tumour which was diagnosed as an epiplocele and an encysted hydrocele. The sac when opened as for the radical cure of hernia was found filled with a large hard mass and inflamed adherent omentum. The sac was a vagino-peritoneal diverticulum, and occupied the whole of the scrotum. The tumour was removed, and was found to consist of a uterus with Fallopian tubes and two testicles. The uterus, the body of which was hypertrophied, measured 9½ cm. in length. On one side the Fallopian tube emerged normally and was adherent at its extremity to a testicle, on the other side the uterine cornu and the testicle were bound together by a fibrous mass. The uterine wall was thickened and the endometrium congested. The testicles were normal, and spermatogenesis was active. No trace of any ovary could be discovered. Section of what appeared to be the Fallopian tube showed it to consist of two tubes—a Fallopian tube and an epididymis running side by side. Attached to the opposite side of the uterus was a small appendage 1 cm. in length, which on examination was also found to contain a Fallopian tube and an epididymis.

This case is apparently unique and difficult to classify. The man could not be called a hermaphrodite, for the external genitals were normal and a prostate was present. The condition appeared to be due to an error of development, giving rise to both a uterus and testicles. The Fallopian tubes are formed from the ducts of Müller, which, by their fusion, give rise to the uterus. In this case there was not only on each side a Fallopian tube, but also an epididymis. Possibly there were four Wolffian and Müllerian ducts, the former giving rise to the epididymis, and the latter to the Fallopian tube on each side of the uterus. A. LIONEL SMITH.

REPORTS OF SOCIETIES.

THE ROYAL SOCIETY OF MEDICINE.

Obstetrical and Gynæcological Section.

Meeting held April 9th, 1908, the President, Dr. Herbert Spencer, *in the chair.*

Dr. H. Macnaughton-Jones read a short communication on the subject of

Primary Unilateral Tuberculosis of the Fallopian Tube

He briefly reviewed the more recent ætiological and histological points bearing on tuberculosis of the female genitalia, dealing with the relative frequency with which the various organs are affected from the vulva to the ovary. The recurrence of primary tuberculosis in any of the genitalia is not common, but a unilateral primary tuberculosis is very rare. His communication dealt with primary unilateral tuberculosis of the Fallopian tube, of which he had met with two instances, and he had one case of primary tuberculosis of both tubes. In all these the rest of the genitalia were healthy. The details of the three were given, and all the removed tubes were shown, together with the microscopical sections. In the case which was the source of this communication, a tubercular pyosalpinx was removed 6½ years ago. She had one twin pregnancy and three other pregnancies since. He had recently to perform on this patient a cœliotomy, 39 days after labour, for an extensive septic perimetritis (the section of the matted adnexa was shown with the epidiascope). There was no evidence of tubercle. She was now perfectly well. All the five children were strong and healthy. Mr. Targett and Dr. Cuthbert Lockyer had made the reports. He had received replies from some 35 leading gynæcologists in the United Kingdom and abroad before bringing the case forward as to the records of such a condition. Only in seven of the home clinics were there records of such a lesion, and in but three of the foreign.

A short communication by Dr. Kedarnath Das, of Calcutta, on

Three Cases of Cæsarean Hysterectomy for Atresia of the Vagina,

appeared among the Select Clinical Reports in the last number of the Journal, p. 351.

Dr. C. Nepean Longridge read a short communication on the

Creatinin Excretion of Lying-in Women,

which appears as an original article on p. 420 of this number of the Journal.

A paper on a case of

Intra-uterine Death of the Fœtus,

occurring in six consecutive pregnancies, was read by Dr. Herbert Williamson and Dr. Eardley Holland, and appeared as an original article on page 342 of the last number of the Journal.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held at Manchester, Friday, April 10th, 1908, Dr. A. J. Wallace (Liverpool), *President, in the chair.*

Dr. Alexander Stookes (Liverpool) exhibited two specimens of

(a) *Fibromyoma Uteri with Unilateral Hydrosalpinx.*

(b) *Adeno-carcinoma of the Corpus Uteri with secondary involvement of the left ovary.*

Dr. Briggs (Liverpool) communicated a case of

Pelvic Kidney with congenital absence of both Müllerian Ducts,

occurring in a patient aged 33 years, 1 year married, who complained of occasional, never periodic, pain in the lower abdomen, and slightly increased frequency of micturition. She had never menstruated.

On physical examination she was a healthy, intelligent woman. The breasts were rather small and the pelvis somewhat undersized. No abdominal tumour could be found. The vagina, 1½ in. in length, ended in a loose *cul de sac*, beyond which the lower pole of a pelvic tumour could be felt. Per rectum the tumour felt to be partly in front and partly to the left of the rectum, but the fingers could not reach the upper limit of the tumour.

On abdominal section, the left kidney was visible, lying totally within the pelvis against the bladder, to which a 1-inch ureter passed. It was one-third larger than normal. The hilum was directed upwards and to the right, so as to face the direction of the renal vessels. A superficial vein, 3 inches long, passed to the inferior vena cava, and covered the renal artery which was apparently derived from the bifurcation of the aorta, and corresponded in site of origin, to a very large middle sacral artery. There was no kidney in the loin of the same side. The right kidney was two-thirds of the normal size. The total absence of uterus, Fallopian tubes, or ovaries, or any representation of them, was manifest.

The disposition of the peritoneum was traced

(*a*) from the bladder in front to the rectum behind, as a smooth pouch, with the deepest portion barely reaching the vaginal *cul-de-sac*.

(*b*) The kidney was fixed in the pelvis, and covered in front by the peritoneum.

(*c*) The rest of the pelvis was lined by a smooth peritoneum devoid of folds.

The operation was purely exploratory.

Dr. Arnold W. W. Lea (Manchester) exhibited a specimen and showed the microscopical section from a case of dermoid cyst of the mesentery.

The patient, a single woman, aged 39, was seen on September 9th, 1907. She had always enjoyed good health, but for the last two months had suffered from abdominal pain, colicky in character, with occasional attacks of vomiting and diarrhœa. Micturition had also become very frequent, and she had herself noticed a swelling in the lower abdomen. Menstruation was normal in type, lasting three days, and unaccompanied by pain. Examination revealed a tender, rounded, abdominal tumour, the size of a fœtal head.

Per vaginam, a mobile cystic tumour was felt to lie in the utero-vesical pouch, displacing the uterus backwards. It was tender on pressure. A diagnosis of small ovarian cyst, with probably some degree of torsion of the pedicle, was made.

On placing the patient in the Trendelenberg position the cyst left the pelvis and disappeared into the abdomen. On abdominal section, the uterus and appendages were normal. The tumour was drawn down and found to be developing between

the layers of the mesentery in the jejunum, and lying close to the intestine. Incision of the mesentery and enucleation of the cyst was carried out without difficulty.

Examination of the specimen showed it to be a unilocular cyst the size of an orange. The external surface was smooth except where it was attached to the bowel. On section it had a firm, thick wall, and contained pultaceous fatty debris. No hair or definite epithelial structures were present. Microscopically, the cyst wall consisted of dense, fibrous tissue, containing blood-vessels, while the lining was composed of large multi-nucleated cells loaded with fat. These cells also extended between the inner layers of the fibrous tissue capsule. There was no evidence of stratified epithelium or glands.

Dr. Lea thought these peculiar cells were possibly from degenerating epithelium or endothelium, and although the microscopical sections did not clearly show the tumour to be a dermoid, he thought it was to be regarded as embryonic in character.

Sir WILLIAM SINCLAIR read a paper on

ANALGESIA *versus* ANÆSTHESIA IN OBSTETRICS AND GYNÆCOLOGY.

He drew attention to the fact that only within recent years was a clear distinction made between surgical pain and obstetric pain. This was partly because the latter was regarded as largely physiological, hence there had been a certain indifference regarding the treatment of the sufferings of childbed.

Until after the middle of the 18th century sedatives did not appear to have been employed in obstetric practice, and then only in exceptionally severe cases.

He referred to the practice of Smellie, whose method seemed to be partly strong assurance that his skill would bring relief, and partly the employment of highly-spiced draughts or "cordials" to mitigate the distress arising from the abnormal pains of some pathological condition. Amongst the few men of mark as obstetricians of that period, who employed quinine sedatives for the relief of puerperal pain, Denman was perhaps the most prominent and independent.

The work of Böer, of Vienna, who adopted English methods after his famous journey through Western Europe in the years just before the French Revolution, was referred to.

Towards the middle of the 19th century came the introduction of chloroform, ether, and nitrous oxide gas. Thought to be a perfect anæsthetic, chloroform also brought its disappointments. Its shortcomings were soon demonstrated to be very much what the experience of half a century has taught us all to accept as the truth. Its long-continued administration had certain unfavourable effects on the pains of labour, while by preventing firm contraction post-partum hæmorrhage and its sequelæ were favoured.

Although since that time ether had been largely used by American obstetricians, its adoption in this country was by no means universal.

Morphia. The reader then reviewed the important contributions of the last half century on this subject.

Reference was made to the work of Pinard in 1878 and to that of Wesenius entitled "Experimental Investigations on the subject of Uterine Contraction during Labour as well as on the influence of Ether and Morphia on Labour Pains" (*Archiv für Gynäkologie*, Bd. lxxxiv, H. 3).

The conclusion of Wasenius was: "That ¼ gr. of morphia administered hypodermically towards the end of the stage of dilatation, or during the process of expulsion, produces next to no effect on the regular process of labour."

Spinal Anæsthesia. The contribution of Brunner in the *Monatsschrift für Geburtshülfe und Gynäkologie* for November, 1907 (Bd. xxvi, H. 5), was next mentioned, in which a very frank description of the unfavourable symptoms and

after effects of spinal anæsthesia by injection of cocaine are enumerated. Bier, and later Anselm Falkner also reported cases in which unpleasant symptoms followed its employment. It has been shown that the effects of spinal anæsthesia on the process of normal labour are simply disastrous. In obstetrics it finds its best application in the severest operations, such as Cæsarean section, and it is of service in many minor gynæcological operations, but its technical difficulties and bye-effects could never be lost sight of.

Morphium-scopolamine. This method also at first favourably reported on by Gauss in a most favourable and uncritical report founded on the observation of a thousand cases in the Obstetric Klinic of Freiburg, was later condemned by Gmunder as dangerous to both mother and child.

Morphia-Alcohol-Cocaine. The reader of the paper advocated the employment of a combination of sedatives, which he had used for several years in the smaller, painful operations of the puerperium, and in some of the minor gynæcological operations and manipulations.

About three-quarters of an hour before the time fixed for operation, the patient is given a full dose of morphia hypodermically, ¼ gr. more or less, according to her bulk. Half an hour or twenty minutes before the operation she receives a soothing draught of two or three ounces of whisky or brandy disguised by the liquid extract of liquorice and diluted. By the appointed time the most timid patient has become apathetic, and the operation can be proceeded with. If there is a laceration of the perineum, it is as well to swab the surface with cocaine, eucain, or novocain. Curettage may now be performed deliberately, the patient rarely complaining of any discomfort. She usually goes off to sleep immediately on being put back to bed, but it is a good plan before permitting her to do so, to administer a full dose of ergotin either hypodermically or as a draught. It is also an advantage to give a copious injection of saline solution by the bowel.

Dr. Kynvett Gordon (Monsall) also spoke in favour of this method. He had carried it out in a large number of cases where, from the critical condition of the patient, a general anæsthetic was contra-indicated.

Dr. Arnold W. W. Lea had performed several painful obstetric manipulations such as the removal of a macerated fœtus from a patient with advanced heart disease, after this method of producing analgesia had been employed.

The President, and several members also spoke, and Sir William Sinclair replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

Section of Obstetrics.

Meeting held Friday, April 10th, 1908, the President, Dr. E. H. Tweedy, F.R.C.P.I., *in the chair.*

A Uterine Tractor.

Dr. Ashe exhibited a working model of an instrument which was, he said, intended to combine a sound with a tractor when necessary.

Dr. Neil spoke in commendation of the tractor.

Pathological Report of an Abnormal Placenta.

Dr. Spencer Sheill read the following pathological report by Dr. Rowlette on the abnormal placenta exhibited at the previous meeting of the Section, as some of the Fellows then present had stated that they had never seen a specimen similar to that exhibited by Dr. Sheill :—

"The placenta is slightly larger than normal, and quite firm. The umbilical

vessels are very congested, and stand out prominently on the surface of the placenta. Completely surrounding the attachment of the cord, and at a distance of about two inches, is a raised ridge, varying from 1½ to 2½ in. high; it bends towards the cord so as to form a deep fossa, the inner surface of the cord being in apposition with the surface of the placenta. The membranes are closely adherent to the surface of the placenta, passing into the depth of the fossa and then over the ridge.

"Microscopically, the placental tissue is normal. At the ridge, however, the membrane is lifted from the tissue by a great mass of fibrinous coagulum, which is quite firm. The greater part of the ridge seems to be composed of fibrin. The condition must, therefore, be due to a sub-membranous hæmorrhage, for which I am unable to suggest any cause."

Sir A. V. Macan expressed the opinion that it was simply an exaggerated placenta circumvallata.

Dr. Sheill, in reply, said that although he was unable to suggest a probable cause for this placental abnormality, yet he could not agree with Sir Arthur Macan's opinion, inasmuch as he understood that the so-called placenta circumvallata invariably showed the chorion forming a rigid annular fold at the inner limit of the margin. Neither did he think it was a case of placenta marginata, for in these the chorion usually leaves the placenta before reaching its margin, thereby leaving a border free of membrane. In reply to a question of Sir Arthur's, Dr. Sheill said that in his specimen the chorion was attached all round to the placental margin in the usual way.

Small Ovarian Cyst, with complete Disappearance of Ovary.

Dr. R. D. Purefoy exhibited two pieces of the remains of a small cyst removed from a young unmarried patient. The particular point of interest in the specimen was that, notwithstanding the small size of the cyst, the ovary had disappeared, leaving nothing except a slight patch of thickening in one part.

A Myomatous Uterus.

Sir W. Smyly said his interest in the myomatous uterus—which he exhibited—was altogether technical. When he examined the patient he was unable to reach the cervix, owing to the extra-peritoneal development of the tumour on the right side of the uterus. When he operated he took the end of the tumour to be the cervix, and there was a depression in it which he took to be the os uteri. When he cut into the capsule there came a good deal of hæmorrhage, which astonished him. When he got it open enough to see where he was, he found he was in the capsule of the tumour, and had not opened the vagina at all. He then completed the operation—Doyen's method—in the usual way. The form of the tumour was exactly in the long axis of the uterus, and there was little wonder that he mistook it for the cervix.

Sir A. V. Macan said he was present at the operation, and could corroborate the difficulty of locating the cervix.

Professor Alfred Smith entirely approved of Sir W. Smyly's procedure.

Sir W. Smyly, in reply to a question by Dr. Jellet, said it was constantly stated that Doyen's operation shortened the vagina, but he himself had never seen any change in the vagina after the operation.

Adjourned Discussion on Sir A. Macan's Paper on the Operative Treatment of Puerperal Infection.

Dr. A. Holmes said it was very hard to make up one's mind, with a case not undoubtedly septic, as to whether an operation was justifiable or not. He had seen cases apparently at the point of death get perfectly well. Evacuation was, of course, the best means of dealing with localized pus; and the opening through the posterior fornix—an easy operation which did not necessitate the removal of the patient from bed—had been followed by good results. When one considered the number of septic

after effects of spinal anæsthesia by injection of cocaine are enumerated. Bier, and later Anselm Falkner also reported cases in which unpleasant symptoms followed its employment. It has been shown that the effects of spinal anæsthesia on the process of normal labour are simply disastrous. In obstetrics it finds its best application in the severest operations, such as Cæsarean section, and it is of service in many minor gynæcological operations, but its technical difficulties and bye-effects could never be lost sight of.

Morphium-scopolamine. This method also at first favourably reported on by Gauss in a most favourable and uncritical report founded on the observation of a thousand cases in the Obstetric Klinic of Freiburg, was later condemned by Gmunder as dangerous to bcth mother and child.

Morphia-Alcohol-Cocaine. The reader of the paper advocated the employment of a combination of sedatives, which he had used for several years in the smaller, painful operations of the puerperium, and in some of the minor gynæcological operations and manipulations.

About three-quarters of an hour before the time fixed for operation, the patient is given a full dose of morphia hypodermically, ¼ gr. more or less, according to her bulk. Half an hour or twenty minutes before the operation she receives a soothing draught of two or three ounces of whisky or brandy disguised by the liquid extract of liquorice and diluted. By the appointed time the most timid patient has become apathetic, and the operation can be proceeded with. If there is a laceration of the perineum, it is as well to swab the surface with cocaine, eucain, or novocain. Curettage may now be performed deliberately, the patient rarely complaining of any discomfort. She usually goes off to sleep immediately on being put back to bed, but it is a good plan before permitting her to do so, to administer a full dose of ergotin either hypodermically or as a draught. It is also an advantage to give a copious injection of saline solution by the bowel.

Dr. Kynvett Gordon (Monsall) also spoke in favour of this method. He had carried it out in a large number of cases where, from the critical condition of the patient, a general anæsthetic was contra-indicated.

Dr. Arnold W. W. Lea had performed several painful obstetric manipulations such as the removal of a macerated fœtus from a patient with advanced heart disease, after this method of producing analgesia had been employed.

The President, and several members also spoke, and Sir William Sinclair replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

Section of Obstetrics.

Meeting held Friday, April 10th, 1908, the President, Dr. E. H. Tweedy, F.R.C.P.I., *in the chair.*

A Uterine Tractor.

Dr. Ashe exhibited a working model of an instrument which was, he said, intended to combine a sound with a tractor when necessary.

Dr. Neil spoke in commendation of the tractor.

Pathological Report of an Abnormal Placenta.

Dr. Spencer Sheill read the following pathological report by Dr. Rowlette on the abnormal placenta exhibited at the previous meeting of the Section, as some of the Fellows then present had stated that they had never seen a specimen similar to that exhibited by Dr. Sheill :—

"The placenta is slightly larger than normal, and quite firm. The umbilical

vessels are very congested, and stand out prominently on the surface of the placenta. Completely surrounding the attachment of the cord, and at a distance of about two inches, is a raised ridge, varying from 1½ to 2½ in. high; it bends towards the cord so as to form a deep fossa, the inner surface of the cord being in apposition with the surface of the placenta. The membranes are closely adherent to the surface of the placenta, passing into the depth of the fossa and then over the ridge.

"Microscopically, the placental tissue is normal. At the ridge, however, the membrane is lifted from the tissue by a great mass of fibrinous coagulum, which is quite firm. The greater part of the ridge seems to be composed of fibrin. The condition must, therefore, be due to a sub-membranous hæmorrhage, for which I am unable to suggest any cause."

Sir A. V. MACAN expressed the opinion that it was simply an exaggerated placenta circumvallata.

Dr. SHEILL, in reply, said that although he was unable to suggest a probable cause for this placental abnormality, yet he could not agree with Sir Arthur Macan's opinion, inasmuch as he understood that the so-called placenta circumvallata invariably showed the chorion forming a rigid annular fold at the inner limit of the margin. Neither did he think it was a case of placenta marginata, for in these the chorion usually leaves the placenta before reaching its margin, thereby leaving a border free of membrane. In reply to a question of Sir Arthur's, Dr. Sheill said that in his specimen the chorion was attached all round to the placental margin in the usual way.

SMALL OVARIAN CYST, WITH COMPLETE DISAPPEARANCE OF OVARY.

Dr. R. D. PUREFOY exhibited two pieces of the remains of a small cyst removed from a young unmarried patient. The particular point of interest in the specimen was that, notwithstanding the small size of the cyst, the ovary had disappeared, leaving nothing except a slight patch of thickening in one part.

A MYOMATOUS UTERUS.

Sir W. SMYLY said his interest in the myomatous uterus—which he exhibited—was altogether technical. When he examined the patient he was unable to reach the cervix, owing to the extra-peritoneal development of the tumour on the right side of the uterus. When he operated he took the end of the tumour to be the cervix, and there was a depression in it which he took to be the os uteri. When he cut into the capsule there came a good deal of hæmorrhage, which astonished him. When he got it open enough to see where he was, he found he was in the capsule of the tumour, and had not opened the vagina at all. He then completed the operation—Doyen's method—in the usual way. The form of the tumour was exactly in the long axis of the uterus, and there was little wonder that he mistook it for the cervix.

Sir A. V. MACAN said he was present at the operation, and could corroborate the difficulty of locating the cervix.

Professor ALFRED SMITH entirely approved of Sir W. Smyly's procedure.

Sir W. Smyly, in reply to a question by Dr. Jellet, said it was constantly stated that Doyen's operation shortened the vagina, but he himself had never seen any change in the vagina after the operation.

ADJOURNED DISCUSSION ON SIR A. MACAN'S PAPER ON THE OPERATIVE TREATMENT OF PUERPERAL INFECTION.

Dr. A. HOLMES said it was very hard to make up one's mind, with a case not undoubtedly septic, as to whether an operation was justifiable or not. He had seen cases apparently at the point of death get perfectly well. Evacuation was, of course, the best means of dealing with localized pus; and the opening through the posterior fornix—an easy operation which did not necessitate the removal of the patient from bed—had been followed by good results. When one considered the number of septic

cases that existed, the mortality was really very small, and the number of cases of sepsis that recovered was very large, and he considered that it would be unwise to operate in all cases until differential diagnosis was more perfect.

Professor ALFRED SMITH said he knew of no uterine affection in which they seemed to be more at sea than in the treatment of puerperal fever; and while the Section was deeply indebted to Sir A. Macan for his thought-stimulating paper, he did not think that it showed any particular advance on the part of surgery in that line. They accepted generally the two great classes of infection—pyogenic and saprophytic; and they divided the former into the forms in which the infection was carried—(*a*) by the lymph ducts, and (*b*) by the blood stream. Bumm had demonstrated the fact that if a patient was infected by streptococcus, it developed and spread with such rapidity that there was no time for the surgeon to intervene. They were all in agreement as to the necessity of draining in cases of pus formation, though there was a difference of opinion as to the way in which they should reach the abscess. Sir A. Macan had proposed a special operation with a view to preventing the occurrence of general peritonitis; but he could not see the advantage of packing the entire pelvic cavity, seeing that the uterus, in a septic woman, after confinement, was almost up to the umbilicus, and that on the posterior wall of the uterus there was the great lymphatic plexus carrying large numbers of streptococci. On the Continent and in America cases had been successfully treated by ligation of the inflamed veins, but the whole difficulty one had to contend with was seeing when one should interfere at all by operation. He believed that the success of surgical procedures would be found in an early recognition of grave cases, and early operation. When they had more knowledge as to the type of bacillus that was causing the trouble, they might be able to do something to stem the fatal cases, and they might be able to devise methods to get a backward flow in the lymph-ducts, so as to prevent the invasion of the system.

Dr. PUREFOY said he refused to believe that any examination of the contents of the uterus would enable them to make up their minds in every case, or even in any considerable number of cases, on the point of operative interference. In the cases of streptococcus infection, the spread of the disease was so rapid, and its diffusion through the system so general, that surgical measures did not hold out hope of saving life. They were unwilling to resort to early operation in these cases, because they were aware that apparently hopeless cases had recovered, and they were unable to determine the power of resistance in the patient.

Dr. ASHE spoke.

Dr. FITZGIBBON said the great difficulty in treating by non-operative methods depended on diagnosing whether the condition was still localized or general, and anticipating general infection. If the infection had become general, it then became a question whether the patient could fight the infection by natural resistance, and the only possible treatment they could adopt was the introduction of anti-toxins or vaccines to assist the system.

Dr. JELLETT said the more he thought about the subject the more hopelessly he seemed to be at sea. He could not understand where the operative treatment of acute puerperal fever came in. The operative treatment of local infections had been recognized for some time, but this was not what they were concerned with. Even if the presence of streptococci in the uterus was shown, the bacteriologist could give them no help as to the virulence of the organism until after injection into animals, and by that time either the patient was better or it was too late for operation. If the infection had not extended into the peritoneal cavity, it was contrary to all our present ideas to open up the cavity. If the infection had gone beyond the uterus, the analogy of limb-infection was fallacious, because the uterus was so intimately bound up with its connective tissue and lymphatics that the removal of the infection

by removing the uterus seemed hopeless. If a patient got into a chronic condition of pyæmia, he could imagine that by removing the source of the infection in the uterus they might do a certain amount of good, as the extension of infection during the operation might be successfully overcome by the resistance set up by a long period of vaccination, so to speak. But in the early stage it did not seem possible to remove the uterus, with its load of infection, and open up the peritoneal cavity, without giving the patient such a dose of the organism as would do away with any good got by removing the prime source of the infection. Pryor, in America, had said, nine or ten years ago, that when there was a case of infection of the uterus that did not respond immediately to douching, they should open up Douglas's pouch straight away, and break down any adhesions and plug the pouch. His results were very good; but he (Dr. Jellett) could not help thinking that Dr. Pryor operated on many cases that would have got well without operation.

Dr. HORNE said it was comparatively seldom that one now saw a case of acute septic infection. The paper stated that the fifth rigor was an indication for operation, but in some of the very worst cases there was possibly only one rigor at the beginning, and to wait for the fifth would be to wait until too late. The plugging of the uterus and the opening of the posterior cul-de-sac was an admirable treatment, which he had adopted with very good results.

Dr. O'FARRELL said that Professor Sondern,* a New York pathologist, claimed that by means of a general and differential leucocyte count he was able not alone to ascertain the presence of a septic infection, but also to estimate the body resistance. Relative increase in polymorphonuclears indicate the presence of sepsis and the degree of leucocytosis the condition of the body resistance. It is not claimed that this is universally accurate, but Dr. Sondern considers it so important that he has an assistant on duty in his laboratory day and night, so as to be able to examine any patient's blood, and let the surgeon know without delay whether the blood conditions are such as to make operation desirable.

Sir W. SMYLY said it was very unlikely that any of them would meet with more than a very few cases in which operative interference was required, and as it had been laid down that they could not judge the value of any particular line of treatment upon less than a hundred cases, it would probably take some centuries before any one institution would yield a sufficient number of cases. They had, therefore, to collect results from a great number of hospitals, and Sir A. Macan's paper was a valuable epitome of such results. He (Sir W. Smyly) objected to the title puerperal fever. In the old days it was restricted to acute lymphatic sepsis. Dr. Churchill had stated long ago that he had only seen seven cases of puerperal fever, and it was evident that the great majority of cases spoken of by Sir A. Macan were localized, not general, sepsis. In douching the uterus they were liable to do harm by opening up channels for the absorption of septic materials. One of the first things they had to do in a case of acute fever following child-birth was to try and clear the uterus with the finger, and he did not think there was any difficulty in doing so if they gave the patient an anæsthetic. He was not inclined to give up the flushing spoon-curette, and he thought the introduction of the brush would be more dangerous than the spoon. In treating puerperal fever, they should be careful not to take the part of the micro-organisms against the organism of the woman. The contest going on in her system was one of such great complexity that one felt very diffident to interfere; and it was very doubtful that a serum would not take the part of the bacteria against the tissues.

The President said his experience was that puerperal infection was common. Fortunately, in the majority of cases, it was of a mild type, and there was, in his

* "Value of the Blood Counts in Sepsis." By Frederic E. Sondern, M.D., *New York Medical Journal*, June 16th, 1906.

experience, no complaint so amenable to surgical treatment. He divided it into the mild, acute and chronic types. The mild type was eminently suited for surgical interference. The chronic type was that dealt with for the most part by Sir A. Macan, and the acute type was outside the pale of all treatment. He divided operative treatment into the mild, the intermediate, and the drastic. Under the mild he put raising the bed, douches, exploration of the uterus, draining pus pools in the uterus, replacing a retroflexed uterus, the removal of pieces of placenta and membrane by the fingers. These could be undertaken without chloroform in the patient's own bed, and were highly successful. The intermediate (Pryor's) operation could be done in the patient's own bed, but required an anæsthetic; it could be conducted without fear of injuring the patient, and it was largely diagnostic as well as curative. The evacuation of pelvic pus through the vagina did not seem to give rise to septic infection. The more septic matter they got out of the system the better chance the leucocytes had to fight the remaining infection, and the opening through the posterior fornix nearly always let free a pool of turbulent peritonitic fluid in Douglas's cul-de-sac. If they could get a pelvic peritonitis well established the patient would probably worry through, and no procedure was more adapted to that purpose than plugging the whole pelvic cavity with iodoform gauze. He believed it impeded the circulation in the lymphatics. The anæsthetic was unfortunately very harmful when given to a septic patient. Until their knowledge was more precise, and their method of operation less calculated to bring about the dreaded shock, he did not think he would ever again open the abdomen above the pubes with the idea of tying off veins or removing a septic uterus. Anti-streptococcus serum was worthless when the disease had developed, though valuable as a prophylactic remedy. When pus had burst into the abdomen, he gave the serum straight off. Vaccines were not applicable for such cases. Lactate of calcium would probably lock up the blood in the veins almost as well as by ligature.

Sir A. V. Macan, in reply, said it might require a hundred cases to make statistics, but it did not require that number to enable them to have ideas on the subject. He had himself expressed his objection to the term puerperal fever, but there was no other term that embraced all the states including sepsis. The uterus had been recognized for a long time as the source of infection, and theoretically they must recognize a point at which—if they could settle it—the removal of the septic centre would be sufficient to stop the spread of the disease. The earlier they operated, the more successful they would be, but the more doubtful it would be as to the success of the operation. There was no finality in the operation; they were only at the beginning of it, and he believed there was a great future before it.

NOTES.

Apart from the deep sorrow caused by the death of our esteemed Editor, we have also with regret to record the deaths of the following distinguished colleagues :—

Dr. Charles Edward Underhill, President of the Royal College of Physicians of Edinburgh, an obstetrician and teacher of acknowledged ability, died on April 24th, 1908, at the age of 63.

Dr. K. G. Lennander, Professor of Surgery and Obstetrics in the University of Upsala.

Dr. Richard Douglas, formerly Professor of Gynæcology and Abdominal Surgery in the Vanderbilt University at Nashville.

Dr. Frederick Keppler, died at Venice on February 25th, 1908. Born in the Black Forest in 1841, he settled in Venice in 1875, but returned to Germany in 1878 to study Gynæcology under Schroeder and Martin. On his return to Italy he passed the State examination at Catania in 1880 to enable him to direct a private clinic in Venice. He was the founder of operative gynæcology in Italy.

Dr. Alfons Mermann died at Mannheim on March 8th, at the age of 55. It was owing to his initiative that the Lying-in Asylum at Mannheim was founded in 1887, to his circumspect and energetic direction that from small beginnings it developed into a model institution with about 1,000 deliveries in the year, and became so successful as to lead to the installation of about 20 similar institutions in Germany—3 of them in Baden.

Dr. Moritz Liebmann, Privatdozent of Obstetrics in the University of Buda Pest.

Dr. Leonardo Gigli, of Florence.

Dr. E. O. Croft has been appointed Reader in Gynæcology in the Leeds University.

The title of Professor has been conferred upon Privatdozent Dr. Sigmund Gottschalk at Berlin, upon Privatdozent Sigfried Hammerschlag at Koenigsberg, upon Privatdozent Paul Kroemer at Berlin, and upon Privatdozent Hugo Winternitz at Halle.

At Copenhagen, Dr. Axel Trolle has qualified as a Privatdozent of Obstetrics and Gynæcology, with a dissertation "On the function of the ovaries and its importance to the general system of the woman," and Dr. Hartmann with one on "The premature detachment of the normally inscribed placenta."

At Göttingen : Privatdozent Dr. Richard Birnbaum has been appointed Chief Physician to the Frauenklinik.

At Heidelberg, Dr. Maximilian Neu has been recognized as a Privatdozent of Gynæcology.

At Jena, Dr. Wilhelm Busse has qualified as a Privatdozent of Obstetrics and Gynæcology.

At Kiev, Dr. Lautenbach, Professor of Pharmacology, has been appointed Professor of Obstetrics.

At Prague, the selected candidates for the chair vacated by von Franqué, owing to his removal to Giessen, were : (1) Dr. Ernst Wertheim of Vienna, Professor von Herff of Basle, Professor Frederick Kleinhans of Prague, and Privatdozent Halban of Vienna. The chair, it is said, has been given to Professor Kleinhans.

At Genoa, Dr. Muzio Pazzi has qualified as Privatdozent of Obstetrics and Gynæcology; Privatdozent Dr. Antonio Zanfrognini, of Genoa, has qualified at Modena, and Dr. Pietro Sirena at Palermo.

The chief subjects for discussion in the Section of Obstetrics and Gynæcology at the Seventy-sixth Annual Meeting of the British Medical Association at Leeds on July 28—31, 1908, will be:

(*a*) Cæsarean Section *versus* other methods of delivery in Contracted Pelvis (Symphysiotomy, Pubiotomy, Craniotomy, and Induction of Labour.)

(*b*) The Treatment of Displacements of the Uterus.

At the Australian Medical Congress to be held at Melbourne, October 19—24, 1908, the subjects for special discussion in the Section of Obstetrics and Gynæcology will be:

1. The Question of the Premature Termination of Pregnancy.
2. The Early Recognition and Treatment of Pelvic Infectious Processes of the Puerperium.
3. Eclampsia.
4. Uterine Fibroids and their Treatment.
5. Dysmenorrhœa.

We have received from the Organizing Secretary, Dr. Emil Grósz, the first circular in regard to the SIXTEENTH INTERNATIONAL MEDICAL CONGRESS, to be held at Buda Pest from August 29th to September 4th, 1909, under the patronage of the Emperor Francis Joseph, with the provisional programme and other papers. Dr. F. W. Pavy, F.R.S., is the President, and Mr. D'Arcy Power the Secretary, of the National Committee for Great Britain. There will be twenty-one sections; the eighth, that of Obstetrics and Gynæcology, has Professor Tauffer as its managing President and Dr. E. Tóth as its managing Secretary. The following subjects will be specially reported on: 'Delivery by rapid dilatation of the cervix,' by Bar of Paris, and Bossi of Genoa; 'The treatment of contracted pelvis and the permament results of operations for widening the pelvis,' by Döderlein of Munich, and Pestalozza of Rome; 'Myoma and pregnancy,' by Engström of Helsingfors, Martin of Berlin, Kufferath of Brussels, Pozzi of Paris and Schauta of Vienna; 'Anæsthesia in Obstetrics and Gynæcology, Lumbal-Anæsthesia, Scopolamine-Morphia,' by Krönig of Freiburg and Tuffier of Paris; 'The treatment of puerperal fever,' by Bumm of Berlin, v. Herff of Basle and Pinard of Paris; and 'Perityphilitis and the diseases of the Adnexa,' by v. Rein of St. Petersburg, v. Rosthorn of Vienna and Segond of Paris. Communications are promised also by Calderini of Bologne, Dragiescu of Bucarest, Hegar of Freiburg, Heinricius of Helsingfors, Kufferath of Brussels, Küstner of Breslau, Landau of Berlin, Pfannenstiel of Kiel, Recasens of Madrid, Wertheim of Vienna and Wyder of Zurich.

GENERAL LIBRARY
UNIV. OF MACH.
JUN 24 1908

Vol. XIII. No. 6.] [June, 1908.

The Journal of Obstetrics and Gynæcology of the British Empire

EDITED (till May 31) BY

Charles J. Cullingworth, M.D.,
with the assistance of
Jameson J. Macan, M.D., and
John S. Fairbairn, M.B.,

and the co-operation of the following in respect of the places named; viz.,

SCOTLAND:
John Wm. Ballantyne, M.D., Edinburgh; and
John M. Munro Kerr, M.B., Glasgow.

IRELAND:
E. Hastings Tweedy, F.R.C.P.I., Dublin.

NORTH OF ENGLAND:
W. E. Fothergill, M.D., Manchester.

BRITISH COLONIES and Over-Sea Dominions:
Sir William Sinclair, M.D., Manchester.

INDIA and other British Dependencies:
Francis H. Champneys, M.D.; and
Surgeon-General A. M. Branfoot, C.I.E.

Editorial Committee.

Henry Briggs, M.B.,
Professor of Midwifery and Gynæcology, University of Liverpool.

Francis Henry Champneys, M.D.
Obstetric Physician and Lecturer on Midwifery, St. Bartholomew's Hospital, London.

Charles J. Cullingworth, M.D.,
Consulting Obstetric Physician, St. Thomas's Hospital, London.

Alban Doran, F.R.C.S.,
Surgeon, Samaritan Free Hospital for Women, London.

T. W. Eden, M.D.,
Assistant Obstetric Physician, Charing Cross Hospital, London.

D. Berry Hart, M.D.,
Lecturer on Midwifery and Diseases of Women, Royal College, Edinburgh.

George Ernest Herman, M.B.,
Consulting Obstetric Physician, the London Hospital.

J. M. Munro Kerr, M.B.,
Physician for Diseases of Women, Western Infirmary, Glasgow; and Obstetric Physician to the Glasgow Maternity Hospital.

Jameson J. Macan, M.D.

Edward Malins, M.D.,
Professor of Obstetrics, University of Birmingham.

Sir William Sinclair, M.D.,
Professor of Obstetrics and Gynæcology, Victoria University, Manchester.

Herbert R. Spencer, M.D.,
Professor of Midwifery in University College Hospital Medical School.

Secretary:
J. S. Fairbairn, M.B.,
Assistant Obstetric Physician, St. Thomas's Hospital, London.

SHERRATT & HUGHES
LONDON: 56, CHANDOS STREET, W.C.
MANCHESTER: AT THE UNIVERSITY PRESS.

Price 2s. 6d. net. Annual Subscription, 25s. post free.
Colonies and Abroad, 28s. post free.
Published Monthly.

MENNEN'S TOILET POWDER

AN ABSOLUTELY PURE AND SAFE ANTISEPTIC POWDER FOR MEDICAL USE.

Analysis by Dr. JOHN THRESH, London Hospital, on application.

A free sample tin will be sent to any physician desiring to test this valuable preparation, which should always be prescribed whenever an antiseptic dusting powder is required, on account of its purity. All Chemists sell it.

LAMONT CORLISS & CO., 11, Queen Victoria Street, LONDON, E.C.

BRAND'S ESSENCE OF BEEF

ALSO

MUTTON, VEAL, CHICKEN.

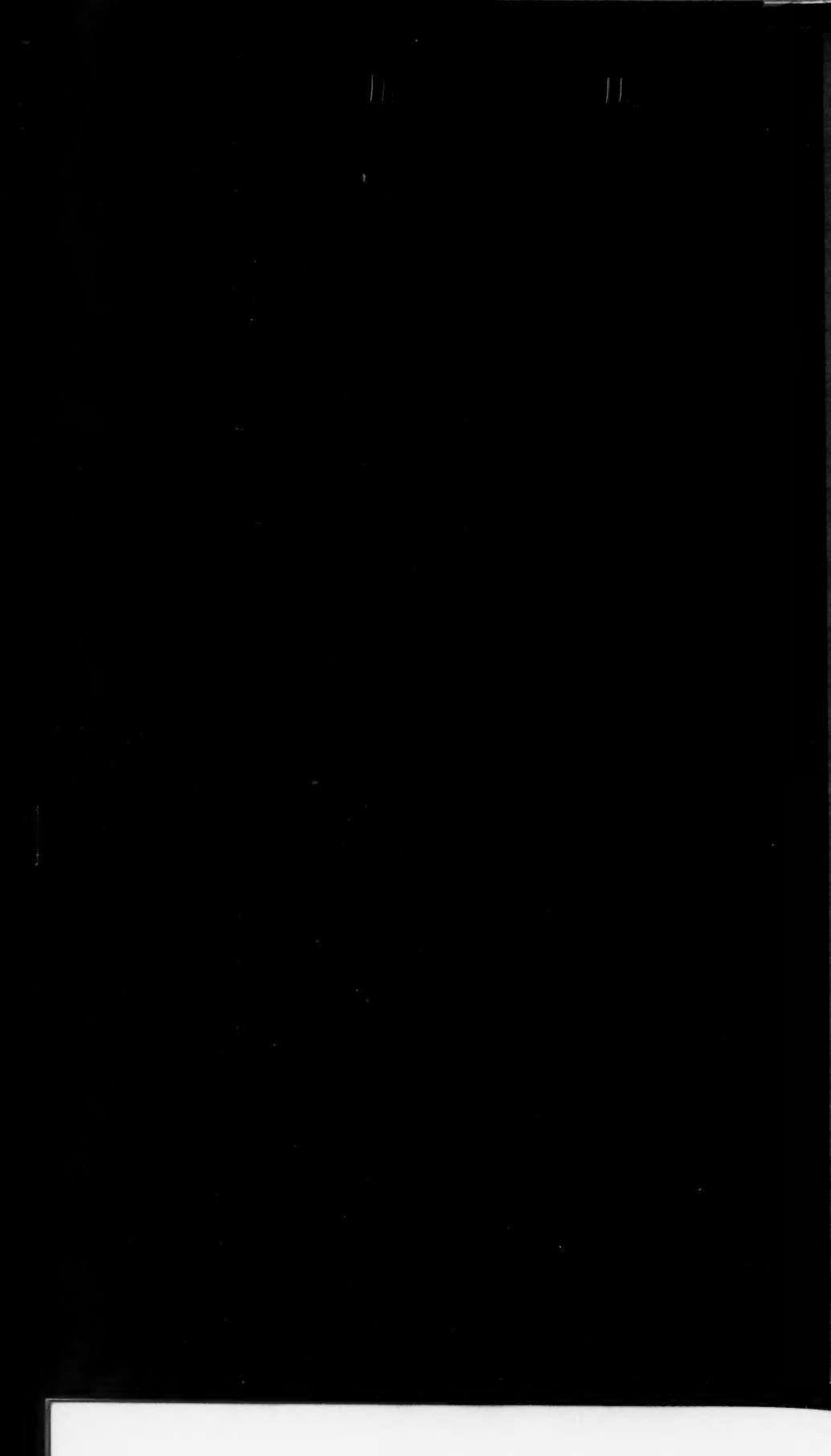
Prepared from finest British Meat

The best restorative after loss of blood from any cause, and in all debilitating ailments.

Recommended by the Medical Profession all over the World.

Price Lists of Invalid Preparations free on application to

BRAND & CO., Ltd., Mayfair, London, W.



'Liebig' and 'Lemco'

We created the trade-mark "Lemco" to make it easy for you to recognise what you want—the original Liebig Company's Extract. No other meat extract can be called "Lemco."

Inferior meat extract may be made under the most undesirable conditions—with no scientific safeguards whatever—from raw material of doubtful and varied origin—but, owing to a decision of the Courts prior to the passing of the Trade Marks Registration Act in 1875, the makers can label it "Liebig's Extract" and mislead the public into thinking they are getting the extract of the Liebig Company.

Be careful to prescribe "Lemco," because it stands for purity and scientific exactitude. All the cattle that are used for "Lemco" are guaranteed and certified to be free from tuberculosis.

"Lemco" is untouched by hand, and every single process of its manufacture is watched over by certified chemists, and as a final safeguard every batch when finished is analysed by Dr. Voit and Dr. Rubner before being put on sale.

Lemco

4, LLOYD'S AVENUE, LONDON, E.C.

Now Ready. Revised Edition **Price 5s. net.**

SURGICAL ANATOMY

BY

G. A. WRIGHT, B.A., M.B. (Oxon.), F.R.C.S.

Professor of Systematic Surgery in the Owens College; Surgeon to the Manchester Royal Infirmary, &c.;

AND

C. H. PRESTON, M.D. B.S. (Lond.), F.R.C.S., L.D.S. (Eng.),

Lecturer on Dental Anatomy in the Owens College; Assistant Dental Surgeon to the Victoria Dental Hospital of Manchester.

Sherratt & Hughes, London and Manchester

The Journal of Obstetrics and Gynæcology of the British Empire Publishing Co. Limited.

INCORPORATED UNDER THE COMPANIES ACTS, 1862 TO 1900.

CAPITAL, £5,000,

Divided into 1,000 Ordinary Shares of £5 each.

Directors.

FRANCIS H. CHAMPNEYS, Esq., M.D., 42, Upper Brook Street, Grosvenor Square, London, W, *Chairman.*
MONTAGU HANDFIELD-JONES, Esq., M.D., 35, Cavendish Square, London, W
GEORGE ERNEST HERMAN, Esq. M.B., 20, Harley Street, London, W.
EDWARD MALINS, Esq., M.D., 50, Newhall Street, Birmingham.
Sir WILLIAM J. SINCLAIR, M D., Garvock House, Dudley Road, Whalley Range, Manchester.
Sir JOHN WILLIAMS, Bt., M.D., Plâs Llanstephan, Carmarthenshire.

Bankers.

THE LONDON & PROVINCIAL BANK, 163, Edgware Road, London, W.

Solicitors.

Messrs. JENKINSON, OWEN, & CO., 5, Frederick's Place, Old Jewry, London, E.C.

Secretary and Offices.

D. W. MEYLER, Esq., 5, Frederick's Place, Old Jewry, London, E.C.

The Company was formed in 1901 for the purpose of establishing a monthly Journal, specially devoted to Obstetrics and Gynæcology, of which the first number appeared in January, 1902.

The aim of the promoters was, in the words of the original prospectus, to make "the Journal an impartial and complete record of British work, an exponent of British Obstetrical and Gynæcological practice, and an encyclopædia of contemporary thought and achievement in Obstetrics and Gynæcology throughout the world." By faithfully following the lines thus indicated, the editors have secured for the Journal of Obstetrics and Gynæcology a high position amongst the scientific medical journals of the day.

The names of the present shareholders are as follows:—

ENGLAND AND WALES.

Barrow-in-Furness.

Archibald Carmichael, Esq., M.D., Duke Street, Dalton Road.

Birmingham.

Edward Malins, Esq., M.D., 50, Newhall Street.
Christopher Martin, Esq., M.B., F.R.C.S., 35, George Road, Edgbaston.
Charles Edwin Purslow, Esq., M.D., 192, Broad Street.
Thomas Wilson, Esq., M.D., 87, Cornwall Street.

Droitwich.

Lionel Claude Everard Calthrop, Esq., M.D., Queen Street.

Leeds.

Edward Octavius Croft, Esq., M.D., 33, Park Square.
John Benjamin Hellier, Esq., M.D., 27, Park Square.

Liverpool.

Henry Briggs, Esq., M.B., 3, Rodney Street.
John Edward Gemmell, Esq., M.B., 28, Rodney Street.
Thomas Babington Grimsdale, Esq., M.B., 29, Rodney Street.
George Arthur Hawkins-Ambler, Esq., F.R.C.S. (Edin.), 30, Rodney Street.
Arthur John Wallace, Esq., M.D., 1, Gambier Terrace.

List of Shareholders—*continued.*

London.

Augustus Whitehorn Addinsell, Esq., M.B., 10, Curzon Street, Mayfair, W.
Miss Louisa Garrett Anderson, M.D. (Lond.), 114a, Harley Street, W.
Henry Russell Andrews, Esq., M.D., 22, Upper Wimpole Street, W.
Robert Hamilton Bell, Esq., M.B. (Executors of), 27, Seymour Street, W.
George Harold Arthur Comyns Berkeley, Esq., M.B., 53, Wimpole Street, W.
James Watt Black, Esq., M.D., 15, Clarges Street, Piccadilly, W.
George Francis Blacker, Esq., M.D., 45, Wimpole Street, W.
John Bland-Sutton, Esq., F.R.C.S., 47, Brook Street, W.
Robert Boxall, Esq., M.D., 40, Portland Place, W.
Mrs. Florence Nightingale Boyd, M.D., 134, Harley Street, W.
Albert Charles Butler-Smythe, Esq., F.R.C.P. (Edin.); F.R.C.S. (Edin.), 76, Brook Street, W.
Francis Henry Champneys, Esq., M.D., 42, Upper Brook Street, W.
Charles James Cullingworth, Esq., M.D., 14, Manchester Square, W.
William Radford Dakin, Esq., M.D., 8, Grosvenor Street, W.
Alban Henry Griffiths Doran, Esq., F.R.C.S., 9, Granville Place, Portman Square, W.
Thomas Watts Eden, Esq., M.D., 26, Queen Anne Street, W.
John Shields Fairbairn, Esq., M.B., 42, Wimpole Street, W.
William Hugh Fenton, Esq., M.D., 27, George Street, Hanover Square, W.
Alfred Lewis Galabin, Esq., M.D., 49, Wimpole Street, W.
Robert Alexander Gibbons, Esq., M.D., 29, Cadogan Place, W.
William John Gow, Esq., M.D., 27, Weymouth Street, W.
Walter Spencer Anderson Griffith, Esq., M.D., 96, Harley Street, W.
Charles Montagu Handfield-Jones, Esq., M.D., 35, Cavendish Square, W.
George Ernest Herman, Esq., M.B., 20, Harley Street, W.
Peter Horrocks, Esq., M.D., 42, Brook Street, W.
Henry Macnaughton Jones, Esq., M.D., 131, Harley Street, W.
Arthur Corrie Keep, Esq., M.D., 14, Gloucester Place, Portman Square, W.
Arthur Hamilton Nicholson Lewers, Esq., M.D., 43, Upper Brook St., Grosvenor Square, W.
Cuthbert Henry Jones Lockyer, Esq., M.D., 117a, Harley Street, W.
Frederick John McCann, Esq., M.D., 5, Curzon Street, Mayfair, W.
Jameson J. Macan, Esq., M.D., Crossgates, Cheam, Surrey.
John David Malcolm, Esq., M.B., 13, Portman Street, W.
William Appleton Meredith, Esq., F.R.C.S., 21, Manchester Square, W.
John Phillips, Esq., M.D., 68, Brook Street, W.
William Rivers Pollock, Esq., M.D., 56, Park Street, Grosvenor Square, W.
George Henkell Drummond Robinson, Esq., M.D., 17, Seymour St., Portman Sq., W.
Amand Jules McConnel Routh, Esq., M.D., 14a, Manchester Square, W.
Mrs. Mary Ann Dacomb Scharlieb, M. D., M.S., 149, Harley Street, W.
Herbert Ritchie Spencer, Esq., M.D., 104, Harley Street, W.
Arthur Francis Stabb, Esq., M.B. 132, Harley Street, W.
James Henry Targett, Esq., M.S., F.R.C.S., 19, Upper Wimpole Street, W.
Walter William Hunt Tate, Esq., M.D., 32, Queen Anne Street, W.
Miss Mary Thorne, M.D., 148, Harley Street, W.
Ralph Harry Vincent, Esq., M.D., 1, Harley Street, W
Miss Helen Webb, M.B., 14, Nottingham Place, W
Herbert Williamson, Esq., M.B., 84, Wimpole Street, W.

Manchester.

Samuel Buckley, Esq., M.D., 72, Bridge Street.
Archibald Donald, Esq., M.D., Sunnyside, Victoria Park.
William Edward Fothergill, Esq., M.D., 13, St. John Street.
Arnold William Warrington Lea, Esq., M.D., B.S., F.R.C.S., 246, Oxford Road.
David Lloyd Roberts, Esq., M.D., 11, St. John Street.
John Scott, Esq., M.D., 249, Upper Brook Street.
Sir William Japp Sinclair, M.D., Garvock House, Dudley Road, Whalley Range.
William Kay Walls, Esq., M.D., 14, St. John Street.

Newcastle-on-Tyne.

Robert Patton Ranken Lyle, Esq., M.D., 11, Ellison Place.

Preston.

John Edward Garner, Esq., M.D., 6, Winckley Square.

Sheffield.

John Wise Martin, Esq., M.D., Claremont, Glossop Road.

Wolverhampton.

Frederick Edge, Esq., M.D., F.R.C.S., Granville House, Tettenhall Road.

Wales.

Ewen John Maclean, Esq., M.D., 12, Park Place, Cardiff.
Sir John Williams, Bart., M.D., Plâs Llanstephan, Carmarthenshire

List of Shareholders—*continued.*

SCOTLAND.

Aberdeen.

Professor William Stephenson, M.D., 3, Rubislaw Terrace.

Dundee.

John Alexander Campbell Kynoch, Esq., M.B., 8, Airlie Place.

Edinburgh.

John William Ballantyne, Esq., M.D., 24, Melville Street.
Alexander Hugh Freeland Barbour, Esq., M.D., 4, Charlotte Square
Sir J. Halliday Croom, M.D., 25, Charlotte Square.
James Haig Ferguson, Esq., M.D., 7, Coates Crescent.
David Berry Hart, Esq., M.D., 29, Charlotte Square.
Sir Alexander Russell Simpson, M.D., 52, Queen Street.

Glasgow.

John Martin Munro Kerr, Esq., M.D., 7, Clairmont Gardens.
J. Hammond Teacher, Esq., M.D., 32, Kingsborough Gardens.

IRELAND.

Belfast.

Miss Marion B. Andrews, M.B., B.Ch., 52, Elmwood Avenue.
Sir John William Byers, M.D., Dreenagh House, Lower Crescent.
John Campbell, Esq. M.D., F.R.C.S., Crescent House, University Road.

Dublin.

Frederick William Kidd, Esq., M.D., 17, Lower Fitzwilliam Street.
Alfred John Smith, Esq., M.B., 30, Merrion Square.
Sir William Josiah Smyly, M.D., 58, Merrion Square.
Ernest Hastings Tweedy, Esq., F.R.C.P.I., Rotunda Hospital.

Indian Medical Service.

Robert Charles MacWatt, M.B., Major, c/o H. S. King & Co., 45, Pall Mall, London, S.W.
Arthur James Sturmer, Lt.-Col. (retired), c/o H. S. King & Co., 45, Pall Mall, London, S.W.

Some Shares still remain unsold. Forms of Application for these Shares, and information as to their price, may be obtained from the Secretary, at the Offices of the Company, 5, Frederick's Place, Old Jewry, London, E.C.

NOTICE.

The "Journal of Obstetrics and Gynæcology of the British Empire" is Published Monthly, price 2/6 per single number. The Annual Subscription is 25/- post free; for the Colonies and abroad, 26/- post free. The Publishers are Messrs. Sherratt and Hughes, 60, Chandos Street, London, W.C.; and 27, St. Ann Street, Manchester, to whom all communications respecting Advertisements or other business relating to the Journal should be addressed.

Communications respecting Editorial matters and Books for review should be addressed to the EDITOR, 60, CHANDOS STREET, LONDON, W.C.

The Editor cannot undertake to return manuscripts, but will endeavour to meet the wishes of contributors in this respect as far as possible.

Authors of original articles are supplied with 25 reprints, in pamphlet form, free; if they desire extra copies they are requested to notify the publishers before the issue of the Journal containing the same.

The right of publication of all original communications in this Journal is reserved.

JEWSBURY
AND
BROWN'S

By Appointment to
H.M. the King.

Mineral Waters

POSSESS THE CONFIDENCE
OF THE MEDICAL PROFESSION.

THE LANCET says:
They are "entitled to praise on account of their Purity and Excellent Quality."

Jewsbury & Brown's

ORIENTAL

Tooth Paste.

THE BEST ANTISEPTIC PREPARATION FOR THE TEETH AND MOUTH.

Its antiseptic constituents are of vegetable origin.
It does not contain any caustic chemical disinfectants.

Tubes, 1s. **Pots, 1s. 6d. and 2s. 6d.**

Ardwick Green, Manchester.

A copy of "Posological Tables B.P. 1898" sent on receipt of Post Card.

LIST OF SOME PUBLICATIONS ON OBSTETRICS, GYNÆCOLOGY, NURSING, ETC.

To be obtained from
SHERRATT & HUGHES, 60 CHANDOS STREET, LONDON, W.C.

OBSTETRICS.

ADLARD & SON, LONDON:

Longridge. The Puerperium. 1st Ed. 1906. 5s. net (cloth).
McCann. The Treatment of Puerperal Infection. 1st Ed. 1906. 1s. net.

JOHN WRIGHT & CO., BRISTOL:

Fothergill. Golden Rules of Obstetric Practice. 5th Ed. 1906. 1s. net.

SMITH, ELDER & CO., LONDON:

Barnes (Robert). A Synoptical Guide to the Study of Obstetrics. 1st Ed. 1883. 3s.
Barnes (Robert and Fancourt). A System of Obstetric Medicine and Surgery. 1st Ed. 1884. Vol. I. 18s. 1st Ed. 1885. Vol. II. 20s.
Playfair. A Treatise on the Science and Practice of Midwifery. 9th Ed. 1898. 28s.

J. & A. CHURCHILL, LONDON:

Jellett. A Short Practice of Midwifery, embodying the treatment adopted at the Rotunda Hospital. 4th Ed. 1903. 8s. 6d.
Ballantyne. Essentials of Obstetrics. 1904. 5s. net.
Barnes. Lectures on Obstetric Operations, including the Treatment of Hæmorrhage. 4th Ed. 1886. 12s. 6d.
Eden. A Manual of Midwifery. 1906. 10s. 6d. net.
Galabin. A Manual of Midwifery. 6th Ed. 1904. 14s. net.
Reynolds. Notes on Midwifery. 2nd Ed. 1886. 4s.
Roberts. The Students' Guide to the Practice of Midwifery. 4th Ed. 1896. 10s. 6d.

LONGMANS, GREEN & CO., LONDON:

Dakin. A Handbook of Midwifery. 18s.
Fothergill. A Manual of Midwifery for the use of Students and Practitioners. 3rd Ed. 1903. 9s. net.

CHAS. GRIFFIN & CO. LTD., LONDON:

Donald. An Introduction to the Study of Midwifery. 5th Ed. 1905. 5s.

HENRY KIMPTON, LONDON:

Peterson. The Practice of Obstetrics. 1906. 31s. 6d. net.
Credé and Leopold. A Short Guide to the Examination of Lying-in Women. 1894. 1s. 6d. net.
Grandin and Jarman. Practical Obstetrics. 1901. 18s. net.
Jewett. The Principles and Practice of Obstetrics.
New Ed. 1907. 25s. net.
Jewett. Essentials of Obstetrics. 2nd Ed. 1902. 10s. 6d. net.
King. A Manual of Obstetrics. 9th Ed. 1904. 12s. 6d. net.
Ashton. Essentials of Obstetrics. 6th Ed. 1905. 4s. net.

H. K. LEWIS, LONDON:

Dührssen. A Manual of Obstetrical Practice for Students and Practitioners. Translation from 6th German Edition 1897. 3s. 6d. net.
Wilson. Deaths in Childbed. 1904. 2s. 6d. net.

E. & S. LIVINGSTONE, EDINBURGH:

Glover. Midwifery Notes, for the Use of Students. 2s. 6d. net.

SIDNEY APPLETON, LONDON:

Williams' Obstetrics. 2nd Ed. 1908. 25s. net.
Wright's Obstetrics. 1st Ed. 1905. 18s. net.
Lusk's Midwifery. 4th Ed. 1901. 21s. net.

Young J. Pentland, Edinburgh and London:

Parvin. Science and Art of Obstetrics. 3rd Ed. 1895. 18s.

Messrs. Rebman Ltd., London:

Edgar. The Practice of Obstetrics. 3rd Ed. 1907. 30s.

Jardine. Clinical Obstetrics. 2nd Ed. 1905. 17s.

MacLennan. Abdominal Examination and Manipulation in Pregnancy. 1902. 6s.

McKerron. Pregnancy, Labour and Childbed, with Ovarian Tumour. 1903. 7s. 6d.

Cassell & Co. Ltd., London, Paris, New York and Melbourne:

Herman. Difficult Labour: A Guide to its Management for Students and Practitioners. 1906. 12s. 6d.

W. B. Saunders Company, London and Philadelphia:

Schäffer. Labour and Operative Obstetrics. 1901. 9s. net.

Schäffer. Obstetric Diagnosis and Treatment. 1901. 13s. net.

Hirst. A Text-book of Obstetrics. 5th Ed. 1906. 21s. net.

Norris. A Text-book of Obstetrics. 2 vols. 1902. 17s. 6d. net per vol.

Dorland. Modern Obstetrics. 2nd Ed. 1901. 17s. net.

GYNÆCOLOGY.

John Wright & Co., Bristol:

Aarons. Golden Rules of Gynæcology. 5th Ed. 1906. 1s. net.

Wilson (T.). Pelvic inflammations in the female. Demy 8vo. Cloth 3s. 6d. net.

Smith, Elder & Co., London:

Balls-Headley. The Evolution of the Diseases of Women. 1st Ed. 1894. 16s.

J. & A. Churchill, London:

Jellett. A Short Practice of Gynæcology. 2nd Ed. 1903. 10s. 6d.

Ballantyne. Essentials of Gynæcology. 1905. 5s. net.

Emmet. The Principles and Practice of Gynæcology. 3rd Ed. 1885. 24s.

Galabin. The Diseases of Women. 6th Ed. 1903. 16s. net.

Reynolds. Notes on Diseases of Women. 4th Ed. 1894. 3s. 6d.

Chas. Griffin & Co. Ltd., London:

Phillips. Outlines of the Diseases of Women. 4th Ed. 1906. 7s. 6d.

W. & A. R Johnston, Edinburgh and London:

Hart (D. B.) and Barbour (A. H. Freeland). Manual of Gynecology. 5th Ed. 1897.

Henry Kimpton, London:

Bovee. The Practice of Gynecology. 1906. 31s. 6d. net.

Crockett. A Text-book of Diseases of Women. 1901. 7s. 6d. net

Dudley. The Principles and Practice of Gynæcology. 1905. 25s. net.

Cragin. Essentials of Gynæcology. 6th Ed. 1906. 4s. net.

H. K. Lewis, London:

Granville Bantock. On the Treatment of Rupture of the Female Perineum Immediate and Remote. 2nd Ed. 1888. 3s. 6d.

Dührssen. A Manual of Gynæcological Practice for Students and Practitioners. 2nd Ed. 1900. 3s. net.

Lewers. Cancer of the Uterus. 1902. 10s. 6d. net.

Lewers. A Practical Text-book of Diseases of Women. 6th Ed. 1903. 10s. 6d.

Taylor. Extra-uterine Pregnancy. 1889. 7s. 6d.

E. & S. LIVINGSTONE, EDINBURGH:

Halliday Croom. Minor Gynæcological Operations and Appliances. 2nd Ed. 6s.

The Students' Handbook of Gynæcology. 5s.

JOHN BALE, SONS & DANIELSSON, LONDON:

Orthmann. A Handbook of Gynæcological Pathology. 1904. 5s. net.

Inglis Parsons. The Operative Treatment of Prolapse and Retroversion of the Uterus. 1906. 3s. 6d. net.

SIDNEY APPLETON, LONDON:

Kelly's Gynæcology. 2 vols. 2nd Ed. 1906. £3. 3s. net.

Pryor's Gynæcology. 1st Ed. 1903. 15s. net.

Cullen. Cancer of the Uterus. 1st Ed. 1900. 31s. 6d. net.

YOUNG J. PENTLAND, EDINBURGH AND LONDON:

Keith. Gynæcological Operations, exclusive of those interfering with the Peritoneal Cavity. 1st Ed. 1900. 5s. net.

Keating and Coe. Clinical Gynæcology, Medical and Surgical. 1st Ed. 1895. 2 vols. 25s. net.

Mann and Hirst. System of Gynecology and Obstetrics. 1st Ed. 8 vols. 12s. 6d. each net.

MESSRS. REBMAN LTD., LONDON:

Montgomery. Practical Gynæcology. 2nd Ed. 1904. 25s.

Bland-Sutton and Giles. The Diseases of Women. 5th Ed. 1906. 11s.

Bishop. Uterine Fibromyomata. 1901. 15s.

Morse. Post-operative Treatment. 1906. 17s. 6d.

CASSELL & CO. LTD., LONDON, PARIS, NEW YORK AND MELBOURNE:

Herman. Diseases of Women: A Clinical Guide to their Diagnosis and Treatment. 1905. 25s.

Bland-Sutton. Surgical Diseases of the Ovaries and Fallopian Tubes, including Tubal Pregnancy. 10s. 6d.

Bland-Sutton. Tumours, Innocent and Malignant: Their Clinical Characters and Appropriate Treatment. 21s. net.

MACMILLAN & CO., LONDON:

Allbutt, Playfair and Eden. System of Gynæcology. 2nd Ed. 1906. 25s. net.

W. B. SAUNDERS COMPANY, LONDON AND PHILADELPHIA:

Hirst. A Text-book of Diseases of Women. 1905. 21s. net.

Ashton. A Text-book on the Practice of Gynæcology. 3rd Ed. 1906. 27s. 6d. net.

Kelly and Noble. Gynecology and Abdominal Surgery. Vol. i. 1907.

Schäffer. Operative Gynæcology. 1904. 13s. net.

Schäffer. Gynecology. 1901. 15s. net.

Penrose. A Text-book of Diseases of Women. 1905. 16s. net.

Webster. A Text-book of Diseases of Women. 1907. 30s. net.

Garrigues. A Text-book of Diseases of Women. 3rd Ed. 1900. 18s. net.

Baldy. A Text-book of Gynæcology. 2nd Ed. 1899. 25s. net.

BAILLIÈRE, TINDALL & COX, LONDON:

Giles (Arthur E.). Gynæcological Diagnosis. 7s. 6d. net.

Macnaughton-Jones (H.). Practical Manual of Diseases of Women and Uterine Therapeutics. 9th Ed.

LIST OF SOME PUBLICATIONS ON OBSTETRICS, GYNÆCOLOGY, NURSING, ETC.—*Continued.*

BOOKS FOR MIDWIVES AND NURSES.

ADLARD & SON, LONDON:

Barnes (Fancourt). A Manual of Midwifery for Midwives. 9th Ed. 1902. 6s.

ARNOLD (EDWARD), LONDON:

Andrews (H. Russell). Midwifery for Nurses. 1906. 4s. 6d. net.

J. & A. CHURCHILL, LONDON:

Cullingworth. A Short Manual for Monthly Nurses. 1s. 6d. 6th Ed. 1907.

Jellett. A Short Practice of Midwifery for Nurses. 2nd Ed. 1905. 6s. 6d. net.

Hadley. Nursing, General, Medical, and Surgical. 1903. 3s. 6d.

LONGMANS, GREEN & CO., LONDON:

Ashby. Health in the Nursery. 4th Ed. 1905. 3s.

Smith. The Handbook for Midwives. 2nd Ed. 1884. 5s.

WM. GREEN & SONS, LONDON:

Fothergill. Lectures for Midwives and Maternity Nurses. 1907. 4s. 6d. net.

CHAS. GRIFFIN & CO. LTD., LONDON:

Humphry. A Manual of Nursing, Medical and Surgical. 29th Ed. 1905. 3s. 6d.

HENRY KIMPTON, LONDON:

Jardine. Practical Text-book of Midwifery for Nurses. 3rd Ed. 1906. 5s. net.

CASSELL & CO. LTD., LONDON, PARIS, NEW YORK AND MELBOURNE:

Berkeley. A Handbook for Midwives and Maternity Nurses. 1906. 5s.

Madden. The Practical Nursing of Infants and Children. 3s. 6d.

Herman. First Lines in Midwifery: A Guide to Attendance on Natural Labour for Medical Students and Midwives. 1906. 5s.

OLIVER & BOYD, EDINBURGH:

Netta Stewart (with Preface by Sir Halliday Croom). Gynæcological Nursing. 2s. 6d.

Bell. Notes on Surgery for Nurses. 6th Ed. 2s. 6d.

THE SCIENTIFIC PRESS LTD., LONDON:

Burrows. Surgical Instruments and Appliances used in Operations. 2nd Ed. 1906. 1s. 6d. net.

Miles. Surgical Ward-work and Nursing. 2nd Ed. 3s. 6d. net.

Watson. A Complete Handbook of Midwifery. 1904. 6s. net.

Haultain. A Practical Handbook of Midwifery. 6s. net.

Loane. Simple Introductory Lessons on Midwifery. 1906. 1s. net.

Ross. Nursing Notes on Midwifery and Gynæcology. 2s. net.

Morten. The Midwives' Pocket Book. 1s.

Hoare. Lectures on Midwifery. 1905. 4s. 6d. net.

Hawkins-Ambler. Gynæcological Nursing. 2nd Ed. 1s.

W. B. SAUNDERS COMPANY, LONDON AND PHILADELPHIA:

Friedenwald. Dietetics for Nurses. 1905. 6s. 6d. net.

De Lee. Obstetrics for Nurses. 1904. 12s. net.

Davis. Obstetric and Gynæcologic Nursing. 1904. 8s. net.

YOUNG J. PENTLAND, EDINBURGH AND LONDON:

Haultain and Haig Ferguson. Handbook of Obstetric Nursing. 5th Ed. 1906. 5s.

To be obtained from

SHERRATT & HUGHES, 60 CHANDOS STREET, LONDON, W.C.

BROMURAL (Knoll)

(α—Monobrom—iso—valerianyl—urea.)

As regards its action, it occupies a position midway between the hypnotics on the one hand and the bromides and valerian preparations on the other. It is a harmless,

POWERFUL NERVE SEDATIVE AND MILD HYPNOTIC,

which causes no by or after-effects, and forms the preliminary for healthy dreamless sleep, from which the patient awakes fresh and invigorated.

DOSE :— as a sedative - - 5 grains several times a day.
as a hypnotic - - 10 grains before bedtime,

KNOLL & CO., 8, Harp Lane, London, E.C.

Medical Books at Tremendous Reductions.

New Books at 25 °/o Discount!!

Books on Obstetrical, Clinical, Pathological, Gynæcological, and **ALL** other Subjects supplied. **Sent on Approval.**

State Wants. Send for Lists.

BOOKS PURCHASED.

M. L. FOYLE, 135, Charing Cross Rd., London, W.C.

Two minutes from Oxford Street).

MILNE'S BATTIST

for use in place of Oiled Silk, Gutta Percha Tissue, Jaconet, and other Protectives, is proof against grease, spirit, and water, and withstands all Antiseptics. Its great advantage over similar materials is that it *can be boiled for two hours without injury*. Efficient sterilisation is thus a very simple process. It is also largely used for making

SURGEONS' COATS AND APRONS,

being light in weight and easy to handle. MILNE'S BATTIST is made in two widths, 36 and 45 inches, and is sold in One Yard boxes and rolls of any length up to Fifty Yards.

Write for Prize List and Sample to

The GALEN Mnfg. Co. Ltd., Wilson St., New Cross Rd., London, S.E.

TABLE OF CONTENTS.

ORIGINAL COMMUNICATIONS.

PAGE

1. The Supports-in-Chief of the Female Pelvic Viscera. By R. H. Paramore, M.D. (Lond.), F.R.C.S. (Eng.). 391
2. On the Pathology and the Operative Treatment of Displacements of the Pelvic Viscera. By W. E. Fothergill, M.A., B.Sc., M.D., Manchester 410
3. Excretion of Creatinin in Lying-in Women: with some Remarks on Involution of the Uterus. By C. Nepean Longridge, M.D. (Vict.), F.R.C.S. (Eng.), M.R.C.P. 420

SELECT CLINICAL REPORTS.

1. A Case of Generally Contracted Flat Reniform Pelvis with Slight Scoliosis (Conj. Vera = 2½ in.). Induction of Premature Labour in 32nd week; Forceps; Child in good health 16½ years later. By Francis Henry Champneys, M.A., M.D. (Oxon.), F.R.C.P.... 430
2. Chorea During Pregnancy. By Wm. Fletcher Shaw, M.D., Resident Surgical Officer, St. Mary's Hospital, Manchester 434

Glasgow Maternity and Women's Hospital 440

Down Bros'. Specialities.

DOWN BROS'. IMPROVED "DESIDERATUM" MIDWIFERY BAGS, with Japanned Tin pull-out drawer, and fitted with removable sterilizable linings.

1/7 Sc

Small Size, containing Barnes' Midwifery Forceps with Simpson's handles, Simpson's Craniotomy Forceps, Denman's Perforator, solid forged Blunt Hook and Crotchet, and Fraenum Scissors, Metal Female Catheter, 3, 2oz. Stoppered bottles in metal cases, Tube Boric Jelly, Bottle Mercurial Pellets, and Spring-top Drop Bottle.

Complete - £6 5s. 6d.

Large Size, containing Barnes' Midwifery Forceps with Simpson's handles, Simpson's Improved Craniotomy Forceps, Solid forged Blunt Hook and Crotchet, Denman's Perforator, Fraenum Scissors, Fowler's Needle for Ruptured Perineum, Metal Female Catheter, Budin's Tube for washing out Uterus, Galabin's Bougie for inducing premature labour, Set Barnes' Improved (Steele's) Hydrostatic Dilators, Skinner's Chloroform Mask, Rodman's Drop Bottle, 4, 2 oz. Stoppered bottles in Metal cases, Tube Boric Jelly, Bottle Mercurial Pellets, Bottle Carbolized Silk.

Complete £8 7s. 6d.

Useful Additions.—Cephalotribe, Saline Infusion apparatus, Champetier de Ribes' Bag, and India Rubber Gloves.

All instruments Nickel-plated and with Aseptic Metal Handles.

Grand Prix. Highest Award, Paris, 1900.

DOWN BROS'. LTD.,

Surgical Instrument Manufacturers,

21, St. Thomas's Street, LONDON, S.E.

Factory: KING'S HEAD YARD, BOROUGH. *(Opposite Guys Hospital.)*

Telegrams: "DOWN, LONDON." Telephones: 8339 Central. 965 Hop.

Southalls' Accouchement Sets.

IN CASES AT 2 GUINEAS, 1 GUINEA, AND HALF-GUINEA.

Containing the necessary requisites selected from SOUTHALLS' "SANITARY SPECIALITIES" for use in Confinement.

In designing these Sets the experience of many Eminent Obstetricians and Trained Nurses has been obtained, with the result that the Sets will be found invaluable as regards Comfort, Cleanliness, and diminution of the risks of septic infection, both to the Nurse, Patient, and Child.

Circulars giving full particulars free on Application.

Southalls' Accouchement Sheets.

ABSORBENT, ANTISEPTIC, AND OF DOWNY SOFTNESS.

Recommended by the Medical and Nursing Professions for Comfort and Cleanliness.

22 by 18, 28 by 25, 33 by 33 inches—1/-, 2/-, and 2/6 each.

Southall Bros. & Barclay, Limited, Birmingham.

Manufacturers of Southalls' Sanitary Towels for Ladies.

BENGER'S FOOD

for

Invalids, Convalescents, and the Aged.

BENGER'S FOOD can be enjoyed and assimilated when other foods disagree. It forms a delicate and highly nutritive cream, rich in all the elements necessary to maintain vigorous health, but entirely free from rough and indigestible particles, which often produce irritation in delicate stomachs.

"Retained when all other foods are rejected."
London Medical Record.

Benger's Food is sold in tins by chemists, &c., everywhere.

REVIEW OF CURRENT LITERATURE.

Adenocarcinoma of the female urethra (Puppel) 450
Ciliary action in the female genitalia (Hoehne, Mandl) 450
The structure of the uterine mucosa (Hitschmann & Adler) 451
Dysmenorrhæa membranacea (Hitschmann & Adler) 451
The beneficial effect of the X-rays on menstrual troubles (Fraenkel) 451
Changes in the Fallopian tubes in menstruation (Holzbach) 452
Arteriosclerosis of the uterus (Slocum) 453
The orthopædic and surgical treatment of displacements (Küstner)... 453
Rest in bed after labour (Martin) 454
Inversion of the uterus and Küstner's operation (Schleier) 454
Carcinoma, diffuse adenoma and tuberculosis in the same uterus (Schütze) 454
The frequency of malignant ovarian tumours (Ravano)... 454
Bilateral hydrosalpinx and pseudomyxoma peritonei (Sitzenfrey) 455
Extra-uterine pregnancy to full term with living child (Potocki) 455
The interstitial glands of the ovary and osteomalacia (Wallart) 457
The treatment of eclampsia (Osterloh) 458
Renal decapsulation for eclampsia (Baumm, Falgowski, Asch) 458
Renal decapsulation for eclampsia (Wiener, Essen-Müller) 459
The suprarenal capsules in eclampsia (Chirié) 459
Intra-abdominal hæmorrhage during uterine pregnancy (Praeger) 460
Repeated pregnancy in a uterus arcuatus (Buecheler) 460
Breech presentations (de Normandie) 461
Rupture of the uterus with intestinal prolapse (Donaldson) 461
Acute vaginal prolapse in a primipara (Engländer) 461
Thoracic fœtal tumour impeding delivery (Heil) 462
Injuries to children due to version (Pforte) 462
Endoscopic examination of the uterus (David) 462
Collargol in puerperal sepsis (Bonnaire & Jeannin) 462
Decalcification of pregnancy continued after delivery (Marquis) 463
The death of the full-term fœtus (Stowe) 463
Bronchiectasis in the fœtus (Kervily) 463
Retro-uterine sensory corpuscles in the human fœtus (Keiffer) 464
Uterus and two tubes present in the tunica vaginalis with two testicles (Cornil and Broussard) 464

REPORTS OF SOCIETIES

Royal Society of Medicine 465
North of England Obstetrical and Gynæcological Society 466
Royal Academy of Medicine in Ireland 468

Notes 473

Now Ready. **Price 2s. 6d. net.**

Polypus of the Nose.

By EUGENE S. YONGE, M.D. (Edin.)

NUMEROUS ILLUSTRATIONS.

Publishers:

SHERRATT & HUGHES,

60, Chandos Street, London, W.C.;

34, Cross Street, Manchester.

THE PRACTITIONER'S LIBRARY OF

GYNECOLOGY, OBSTETRICS AND PEDIATRICS.

EDITED BY

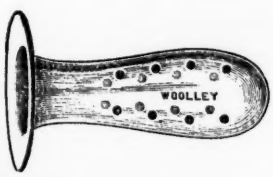
J. Wesley Bovee, M.D.	Reuben Peterson, M.D.	W. Lester Carr, M.D.
836 pages, 382 engravings, 60 plates, mostly colored.	1087 pages, 523 engravings, 30 plates, mostly colored.	1014 pages, 199 engravings, 32 plates, mostly colored.

A new and complete practical library on three closely related and major specialities in original contributions by eminent English and American authorities. Each writer has presented the most advanced knowledge of established value, and has included his own observations of disease and the therapeutic measures which have resulted in the greatest success. This adds to each contribution a personal element of obvious value, as the authors are without exception clinicians and teachers of wide experience. Abundant engravings and full page plates illuminate the text, the facilities at command of the editors having enabled them to secure photographs and drawings exhibiting any point desired. Though it is manifestly to the advantage of every physician to have this whole library at hand, the volumes are sold separately for the convenience of those interested in the individual specialities. *Full prospectus free on application.*

Price per single volume: Half Persian leather, gilt top, £1 11s. 6d. net.
Price of any two volumes: ,, ,, ,, ,, £3 net.
Price of the three volumes: ,, ,, ,, ,, £4 4s. net.

London: HENRY KIMPTON, 13, FURNIVAL STREET, HOLBORN, E.C.

The Teat Vaginal Drainage Tube



Introduced by Sir William Sinclair,

Can now be obtained from

JAMES WOOLLEY, SONS & CO. LTD.

Victoria Bridge, Manchester.

The Prices are as follow:

1s. 3d., 1s. 6d., 1s. 8d., and 2s. each.

GLYCERIN. HEROIN CO. (Woolley).

Each fluid drachm represents $\frac{1}{16}$ of a grain of Heroin Hydrochloride and three grains of Ammonium Hypophosphite, combined with Hyoscyamus, Tolu, Glycerin, and Aromatics.

Glycerin. Heroin Co. has been usefully employed in the treatment of Coughs, Phthisis, Bronchitis, Laryngitis, Pneumonia, Asthma, etc.

Dose—Adults, 1 fluid drachm; Children (over three years) 5 to 30 minims, according to age.

UNGUENTUM SEDATIVUM (Woolley).

Containing 5 per cent. of Zinc Oxide and 2 per cent. of Carbolic Acid, with other ingredients of a soothing and emollient nature.

For use in *eczema*, *pruritus*, *chafes*, and other inflammatory conditions of the skin.

The Practitioner says :—**"We have found this Ointment very useful in the treatment of chafed, chapped, and rough conditions of the skin; also in some forms of eczema and pruritus."**

LIQUOR THYMOL ALKALINUS (Woolley).

An alkaline antiseptic deodorising solution, containing Thymol, Menthol, Eucalyptol, Sodium Benzoate, Borax, &c.

This preparation is indicated in affections of the mucous membrane and in catarrhal conditions of the nose and throat. It has been most successfully used as a nasal douche.

DIRECTIONS FOR USE.

As a nasal douche, dilute with 3 to 5 parts of warm water.
As a gargle, " " 2 to 4 " water.
As a mouth wash, " " 1 to 3 " "

DECALCIFIED CANCELLOUS TISSUE.

(As suggested by Dr. F. W. ROBINSON, Honorary Surgeon, Huddersfield Infirmary.)

An absorbable dressing for use in the treatment of *granulating wounds*, *obstinate fistulæ*, and *callous ulcers*.

Descriptive circular, with instructions for use, forwarded on application.

Supplied in 4 oz. & 8 oz. stoppered bottles, 2/6 & 4/6 each

James Woolley, Sons & Co., Ltd.

Manufacturing Pharmaceutical Chemists,
WHOLESALE AND EXPORT DRUGGISTS,
MANCHESTER.

Dionin.

A freely soluble Morphia Derivative yielding a neutral aqueous solution, devoid of the secondary properties of Morphia. An excellent Analgesic and Sedative in painful diseases of women.

Fibrolysin.

A Thiosinamine compound, easily soluble in water. Effective for softening and removing Scar Tissue; promotes absorption of the exudates of the feminine sexual organs. Used in Chronic Parametritis, Fibromyomata, &c.

Perhydrol.

Merck's Peroxide of Hydrogen, chemically pure, absolutely free from acid, containing 30 % by weight of $H_2O_2 = 100$ volumes of oxygen. An excellent Disinfectant and Antiseptic, possessing deodorising and hæmostatic properties which render it eminently adapted for gynæcological and obstetric purposes.

Stypticin.

By long experience and extensive use shown to be a promptly acting hæmostatic in uterine bleeding not due to anatomical changes after miscarriage and parturition, especially in functional bleeding.

Tropacocain.

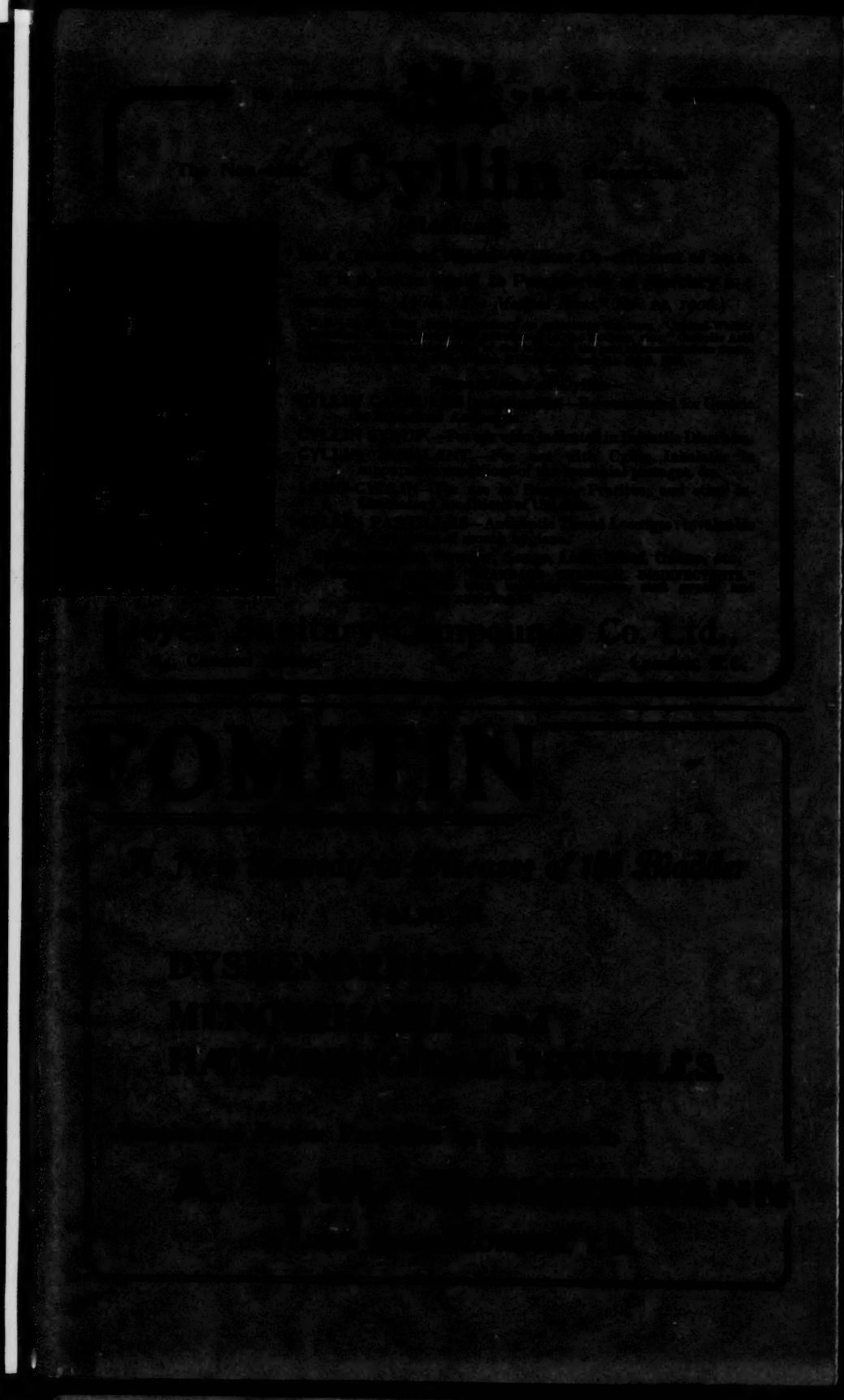
This anæsthetic is to be preferred in consequence of its relatively non-poisonous character. It is especially recommended for the production of Spinal Anæsthesia in Surgical and Gynæcological practice.

Samples and Literature will be sent, post free, on application to

Chemical Works, Darmstadt.

London Office: 16, Jewry Street, E.C.

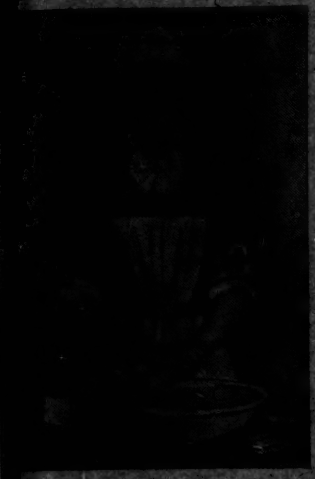
Telephone: 13736 Central. **Telegrams: "Bissula, London."**



By Appointment to H.M. the King.

The Non-toxic **Cyllin** Bactericide.

(Medical)



Has a guaranteed **Rideal-Walker Co-efficient of 20.0.**

It is therefore **equal to Perchloride of Mercury** as a bactericide. (*Vide "The Medical Press," Feb. 14, 1906.*)

N.B.—It has been found necessary to substitute the term "Rideal-Walker Co-efficient" for that originally introduced by the authors, viz., "Carbolic Acid Co-efficient," owing to the abuse of the latter on the part of unscrupulous manufacturers and vendors.—*Vide British Medical Journal*, 6th April, 1907.

Preparations of Cyllin—

CYLLIN CAPSULES (palatineids)—Recommended for Gastric or Intestinal Antisepsis.

CYLLIN SYRUP.—For use when indicated in Infantile Diarrhœa.

CYLLIN INHALANT.—For use with Cyllin Inhalator in suppurative conditions of the bronchial passages, &c.

LANO-CYLLIN—For use in Eczema, Pruritus, and other inflammatory conditions of the skin.

CYLLIN PASTILLES—Antiseptic Throat Lozenges: invaluable for purposes of mouth hygiene.

Cyllin Dusting Powder, Soaps, Lint, Wool, Gauze, etc.

See Pamphlet entitled "STANDARD CHEMICAL DISINFECTANTS." Copies, together with working Samples, sent gratis and postage paid on applying to

Jeyes' Sanitary Compounds Co. Ltd.,

64, Cannon Street, London, E.C.

FOMITIN

A New Remedy in Diseases of the Bladder

ALSO IN

DYSMENORRHŒA,

MENORRHAGIA, and

HÆMORRHOIDAL TROUBLES.

Samples and Further Particulars on application to

A. & M. ZIMMERMANN

3, Lloyds Avenue, LONDON, E.C.

MODERN THERAPY

Bacterial Vaccines

prepared in the Vaccine Laboratory of the Department for Therapeutical Inoculation, St. Mary's Hospital, London, W., under the supervision of the Director, Sir A. E. Wright, M.D., F.R.S., etc.

STAPHYLOCOCCUS VACCINE

Prepared from cultures of various strains of staphylococcus.

Applicable to the treatment of ordinary furunculosis, suppurating acne, staphylococcic sycosis and all other forms of staphylococcus infection.

Supplied in three dilutions, respectively containing 100, 200 and 500 millions of staphylococci per c.c.

GONOCOCCUS VACCINE

Prepared from cultures of gonococcus. Applicable to the treatment of chronic gonococcal rheumatism.

Supplied in a dilution containing 5 millions of gonococci per c.c.

STREPTOCOCCUS VACCINE

Prepared from cultures of streptococcus isolated from cases of erysipelas.

Applicable to the treatment of streptococcal lymphangitis, erysipelas, and other strictly localised forms of streptococcus infection.

Supplied in two dilutions, respectively containing 5 and 10 millions of streptococci per c.c.

TYPHOID VACCINE

Prepared from cultures of the typhoid bacillus.

Applicable only for preventive inoculation.

Supplied in two dilutions, respectively containing 1000 and 2000 millions of bacilli per c.c.

TUBERCLE VACCINE ("Tuberculin")

This vaccine consists of Tubercle Bacillary Emulsion. It is applicable in particular to the treatment of chronic, strictly localised, and apyrexic tubercular affections. It is supplied in two dilutions, respectively containing *in each* c.c. 1-2000 and 1-5000 milligramme of the comminuted tubercle culture.

These vaccines are intended to be used solely under the direction of a medical practitioner. They are supplied in hermetically-sealed glass bulbs containing rather more than 1 c.c. Further information will be sent on request.

Sole agents for the sale of the above-mentioned Bacterial Vaccines:

PARKE, DAVIS & Co., 50-54 BEAK ST., REGENT ST., LONDON, W.

Telegraphic and Cable Address: "Cocoon, London." Telephones: [illegible]

118

Printed and Published by Barratt & Hughes, Chandos Street, London, W.C.